

STIC SEARCH

=> file reg

FILE 'REGISTRY' ENTERED AT 11:38:40 ON 17 AUG 2004
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
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Property values tagged with IC are from the ZIC/VINITI data file
provided by InfoChem.

STRUCTURE FILE UPDATES: 16 AUG 2004 HIGHEST RN 727651-15-2
DICTIONARY FILE UPDATES: 16 AUG 2004 HIGHEST RN 727651-15-2

TSCA INFORMATION NOW CURRENT THROUGH MAY 21, 2004

Please note that search-term pricing does apply when
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more
information enter HELP PROP at an arrow prompt in the file or refer
to the file summary sheet on the web at:
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> d his

(FILE 'HOME' ENTERED AT 09:56:55 ON 17 AUG 2004)

FILE 'HCA' ENTERED AT 09:59:07 ON 17 AUG 2004
E US20040086443/PN

L1 1 S E3
SEL L1 RN

FILE 'REGISTRY' ENTERED AT 09:59:40 ON 17 AUG 2004
L2 10 S E1-E10

FILE 'LCA' ENTERED AT 09:59:48 ON 17 AUG 2004
L3 2119 S (RETARDER? OR INHIBITOR? OR SUPPRESSOR? OR SCAVENG?)
L4 1899 S SULFUR# OR SULPHUR# OR (SULFUR# OR SULPHUR#) (N)HYDRIDE## OR H

FILE 'HCA' ENTERED AT 10:04:28 ON 17 AUG 2004
L5 946220 S L3
L6 666696 S L4
L7 3153 S L5(3N)L6

FILE 'LCA' ENTERED AT 10:05:13 ON 17 AUG 2004
L8 65 S SULFHYDRYL# OR SULPHYDRIL#
L9 1597 S RECOVER? OR RECLAIM? OR RECLAMAT? OR RE(W) (COVER? OR CLAMAT?
L10 5286 S LIQUID# OR LIQ# OR MOLTEN# OR FLUID? OR MELTED? OR LIQUIF? OR
L11 3282 S SUSPEN? OR DISPERS? OR COLLOID? OR EMULS? OR MICROEMULS? OR S

FILE 'HCA' ENTERED AT 10:12:44 ON 17 AUG 2004
L12 22428 S L8

L13 20487 S L4(3N) (L10 OR L11)
L14 85 S L7 AND L12

FILE 'HCA' ENTERED AT 10:14:14 ON 17 AUG 2004

FILE 'REGISTRY' ENTERED AT 10:14:35 ON 17 AUG 2004

L15 6 S L2 AND 1-10/NR
L16 4 S L2 NOT L15
L17 2 S L16 AND SULFUR
L18 1 S L17 AND 1-3/H
L19 1 S L17 NOT L18
L20 2 S L16 NOT L17
L21 1 S L15 AND CYCLOHEXENE
L22 7 S (L15 OR L20) NOT L21

FILE 'HCA' ENTERED AT 10:17:18 ON 17 AUG 2004

L23 126935 S L19
L24 7587 S L19/P
L25 26196 S L22
L26 47166 S L18

FILE 'LCA' ENTERED AT 10:18:34 ON 17 AUG 2004

FILE 'HCA' ENTERED AT 10:21:26 ON 17 AUG 2004

L27 16554 S L4(2N) (L10 OR L11)
L28 3181 S L27 AND (73/SX,SC OR 55/SX,SC OR 53/SX,SC)
L29 13373 S L27 NOT L28
L30 568 S L24 AND (L13 OR L7)
L31 16503 S L29 OR L30 OR L7

FILE 'REGISTRY' ENTERED AT 10:25:48 ON 17 AUG 2004

FILE 'HCA' ENTERED AT 10:25:59 ON 17 AUG 2004
L32 TRA L31 1-4000 RN : 14182 TERMS

FILE 'REGISTRY' ENTERED AT 10:28:03 ON 17 AUG 2004
L33 14181 SEA L32

FILE 'HCA' ENTERED AT 10:29:28 ON 17 AUG 2004
L34 TRA L31 4001-10000 RN : 14825 TERMS

FILE 'REGISTRY' ENTERED AT 10:32:29 ON 17 AUG 2004
L35 14818 SEA L34

FILE 'HCA' ENTERED AT 10:33:30 ON 17 AUG 2004
L36 TRA L31 10001-16503 RN : 8822 TERMS

FILE 'REGISTRY' ENTERED AT 10:36:56 ON 17 AUG 2004
L37 8811 SEA L36
L38 32443 S L33 OR L35 OR L37

FILE 'LREGISTRY' ENTERED AT 10:44:06 ON 17 AUG 2004
L39 STR
L40 STR L39
L41 STR

FILE 'REGISTRY' ENTERED AT 10:52:00 ON 17 AUG 2004
L42 50 S L40 OR L41 SSS SAM SUB=L38

L43 7 S L41 SSS SAM SUB=L38

FILE 'LREGISTRY' ENTERED AT 10:53:44 ON 17 AUG 2004

L44 STR L40

L45 STR L44

FILE 'REGISTRY' ENTERED AT 10:58:14 ON 17 AUG 2004

L46 50 S L45 OR L41 SSS SAM SUB=L38

FILE 'LREGISTRY' ENTERED AT 10:59:10 ON 17 AUG 2004

L47 STR L45

L48 STR L45

FILE 'REGISTRY' ENTERED AT 11:01:51 ON 17 AUG 2004

L49 11 S L47 OR L41 SSS SAM SUB=L38

FILE 'LREGISTRY' ENTERED AT 11:02:39 ON 17 AUG 2004

FILE 'REGISTRY' ENTERED AT 11:09:08 ON 17 AUG 2004

L50 50 S L45 OR L41 SSS SAM SUB=L38

L51 4286 S L45 OR L41 SSS FULL SUB=L38

SAVE L51 HRTZG243/A

L52 11 S L47 OR L41 SSS SAM SUB=L51

L53 257 S L47 OR L41 SSS FULL SUB=L51

SAVE L51 HRTZG243A/A

DELETE HRTZG243A/A

SAVE L53 HRTZG243A/A

L54 4029 S L51 NOT L53

FILE 'HCA' ENTERED AT 11:13:18 ON 17 AUG 2004

L55 207497 S L53

L56 1996977 S L54

L57 53 S L24 AND L55

L58 674 S L24 AND L56

L59 529810 S CARBONATE# OR ANHYDRIDE# OR EPOXIDE# OR POLYANHYDRIDE#

L60 29 S L57 AND L59

L61 2 S L60 AND L13

L62 171 S L58 AND L59

L63 15 S L62 AND L13

L64 2 S L62 AND L12

L65 1 S L57 AND L12

L66 221878 S L4/TI

L67 93 S L62 AND L66

L68 187433 S 49/SX,SC

L69 64 S L62 AND L68

L70 6 S L69 AND L13

L71 1 S L69 AND L12

L72 17 S L69 AND L10

L73 17 S L72 AND L4

L74 QUE PREPARATION?

L75 8 S L61 OR L64 OR L65 OR L70 OR L71

L76 17 S L72 OR L73

L77 27 S L76 OR L63

L78 29 S L77 OR L75

L79 26 S L78 AND 1907-2001/PY,PRY

L80 23 S L79 AND L74

L81 26 S L79 OR L80

L82 26 S L81 AND L59

L83 62 S L69 AND 1907-2000/PY,PRY
L84 46 S L83 NOT L82

FILE 'LCA' ENTERED AT 11:26:50 ON 17 AUG 2004
L85 6605 S RECOVER? OR WINN? OR PURIF? OR PURE# OR OXIDATION#

FILE 'HCA' ENTERED AT 11:34:29 ON 17 AUG 2004
L86 36536 S L6(3N)L85
L87 29 S L84 AND L86
L88 25 S L78 AND 1907-2000/PY,PRY
L89 54 S L88 OR L88 OR L87
L90 54 S L89 AND (L55 OR L56)

FILE 'REGISTRY' ENTERED AT 11:38:40 ON 17 AUG 2004

=> d que stat L51

ARDITH,

I PERFORMED A TEXT SEARCH FOR MOLTEN SULFUR AND WHERE SULFUR WAS FORMED AS A PRODUCT AND TRANSFERED THE REGISTRY NUMBERS FROM THE CA RECORDS INTO THE REGISTRY FILE. I THEN DID A STRUCTURE SEARCH OF THE EXPOXIDE, ANHYDRIDE FROM THE REGISTRY NUMBERS THAT WERE TRANSFERRED FROM CHEMICAL ABSTRACTS INTO THE REGISTRY FILE.

TEXT SEARCH

L2 10 SEA FILE=REGISTRY ABB=ON PLU=ON (108-32-7/BI OR 122-60-1/BI OR 123-54-6/BI OR 138-86-3/BI OR 2461-15-6/BI OR 25377-73-5/BI OR 26560-94-1/BI OR 26761-45-5/BI OR 7704-34-9/BI OR 7783-06-4/BI)

L4 1899 SEA FILE=LCA ABB=ON PLU=ON SULFUR# OR SULPHUR# OR (SULFUR# OR SULPHUR#) (A)HYDRIDE## OR H2S OR MERCAPTO# OR SULFIDE# OR SULPHIDE#

L5 946220 SEA FILE=HCA ABB=ON PLU=ON (RETARDER? OR INHIBITOR? OR SUPPRESSOR? OR SCAVENG?)

L6 666696 SEA FILE=HCA ABB=ON PLU=ON SULFUR# OR SULPHUR# OR (SULFUR# OR SULPHUR#) (A)HYDRIDE## OR H2S OR MERCAPTO# OR SULFIDE# OR SULPHIDE#

L7 3153 SEA FILE=HCA ABB=ON PLU=ON L5(3A)L6

L10 5286 SEA FILE=LCA ABB=ON PLU=ON LIQUID# OR LIQ# OR MOLTEN# OR FLUID? OR MELTED? OR LIQUIF? OR COLLOIDAL#

L11 3282 SEA FILE=LCA ABB=ON PLU=ON SUSPEN? OR DISPERS? OR COLLOID? OR EMULS? OR MICROEMULS? OR SLURR?

L13 20487 SEA FILE=HCA ABB=ON PLU=ON L4(3A)(L10 OR L11)

L15 6 SEA FILE=REGISTRY ABB=ON PLU=ON L2 AND 1-10/NR

L16 4 SEA FILE=REGISTRY ABB=ON PLU=ON L2 NOT L15

L17 2 SEA FILE=REGISTRY ABB=ON PLU=ON L16 AND SULFUR

L18 1 SEA FILE=REGISTRY ABB=ON PLU=ON L17 AND 1-3/H

L19 1 SEA FILE=REGISTRY ABB=ON PLU=ON L17 NOT L18

L24 7587 SEA FILE=HCA ABB=ON PLU=ON L19/P ← Preparation of sulfur.

L27 16554 SEA FILE=HCA ABB=ON PLU=ON L4(2A)(L10 OR L11)

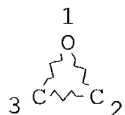
L28 3181 SEA FILE=HCA ABB=ON PLU=ON L27 AND (73/SX,SC OR 55/SX,SC OR 53/SX,SC)

searched very broadly

L29 13373 SEA FILE=HCA ABB=ON PLU=ON L27 NOT L28
 L30 568 SEA FILE=HCA ABB=ON PLU=ON L24 AND (L13 OR L7)
 L31 16503 SEA FILE=HCA ABB=ON PLU=ON L29 OR L30 OR L7
 L32 TRANSFER PLU=ON L31 1-4000 RN : 14182 TERMS
 L33 14181 SEA FILE=REGISTRY ABB=ON PLU=ON L32
 L34 TRANSFER PLU=ON L31 4001-10000 RN : 14825 TERMS
 L35 14818 SEA FILE=REGISTRY ABB=ON PLU=ON L34
 L36 TRANSEER PLU=ON L31 10001-16503 RN : 8822 TERMS
 L37 8811 SEA FILE=REGISTRY ABB=ON PLU=ON L36
 L38 32443 SEA FILE=REGISTRY ABB=ON PLU=ON L33 OR L35 OR L37
 L41 STR

CHEMICAL
 ABSTRACT
 RECORD
 FROM WHICH
 REGISTRY #'s
 WERE TRANSFERRED
 INTO REG.

My search was of these reg #'s.

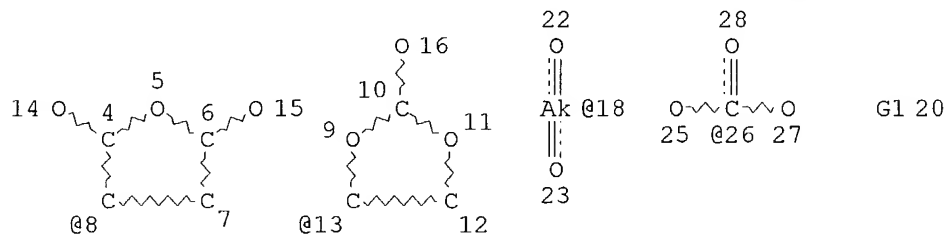


NODE ATTRIBUTES:
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 3

STEREO ATTRIBUTES: NONE
 L45 STR

I searched very broadly.



VAR G1=8/13/18/26

NODE ATTRIBUTES:
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 21

STEREO ATTRIBUTES: NONE
 L51 4286 SEA FILE=REGISTRY SUB=L38 SSS FUL L45 OR L41

100.0% PROCESSED 17342 ITERATIONS
 SEARCH TIME: 00.00.02

4286 ANSWERS

=> file hca

FILE 'HCA' ENTERED AT 11:39:31 ON 17 AUG 2004
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FILE COVERS 1907 - 13 Aug 2004 VOL 141 ISS 8
FILE LAST UPDATED: 13 Aug 2004 (20040813/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d L90 1-54 ti

L90 ANSWER 1 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Difference detection methods using matched multiple dyes

L90 ANSWER (2) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Hydrogen **sulfide** abatement in **molten sulfur**

L90 ANSWER (3) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Process for removing sulfur compounds from hydrocarbon streams

L90 ANSWER (4) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Method for oxidizing hydrogen sulfide to elemental sulfur

L90 ANSWER (5) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Method and composition for removing CO₂ and H₂S from gas mixtures

L90 ANSWER (6) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Study on removal of hydrogen **sulfide** from refinery acid gas by chemical absorption-catalytic oxidation in aqueous solution

L90 ANSWER (7) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI **Recovery** of **sulfur** from treated product gases from gasification of coal or heavy oils

L90 ANSWER 8 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Processing of sulfur-containing materials from flue gas desulfurization or related sources for calcium compound recovery

L90 ANSWER (9) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Process for preparing an agent based on **colloidal sulfur**

obtained from sulfane for the protection of agricultural plants

- L90 ANSWER 10 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI A biological process for the reclamation of flue gas desulfurization gypsum using mixed sulfate-reducing bacteria with inexpensive carbon sources
- L90 ANSWER 11 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Manufacture of gypsum from **sulfur** derived from desulfurization of petroleum products
- L90 ANSWER 12 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Recycling of FGD gypsum to calcium **carbonate** and elemental sulfur using mixed sulfate-reducing bacteria with sewage digest as a carbon source
- L90 ANSWER 13 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Elemental **sulfur recovery** from flue gases.
- L90 ANSWER 14 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Combination of a sulfur compound and specific phosphorus compounds and their use in lubricating compositions, concentrates and greases
- L90 ANSWER 15 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Processing of residue from coal **fluidized-bed** gasification
- L90 ANSWER 16 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Method for recovering sulfur in a wet desulfurization of gases
- L90 ANSWER 17 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Recovery of technical **sulfur** from concentrates resulted from flotation of ores containing **sulfur**
- L90 ANSWER 18 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Flue Gas Desulfurization Scheme To **Recover** Elemental **Sulfur**
- L90 ANSWER 19 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Process for **recovering sulfur** from carbon dioxide- and hydrogen sulfide-containing acid gas mixtures
- L90 ANSWER 20 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI **Purification** of **sulfur**
- L90 ANSWER 21 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Continuous biological process for the elimination of malodorous **sulfur** compounds present in gas mixtures
- L90 ANSWER 22 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Removal and **recovery** of **sulfur** dioxide from waste gases, especially from metallurgical plants, and from flue gases
- L90 ANSWER 23 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Petrology of Philippine geothermal systems and the application of alteration mineralogy to their assessment
- L90 ANSWER 24 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Manufacture of sublimed amorphous **sulfur**

- L90 ANSWER 25 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Soda recovery from metallurgical slags
- L90 ANSWER 26 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Production of water-suspendable liquid or solid sulfur concentrates
- L90 ANSWER 27 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI MHD seed recovery and regeneration
- L90 ANSWER 28 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Process for removal of hydrogen sulfide from sour gas streams
- L90 ANSWER 29 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Method and apparatus for purifying raw gases from coal gasification while producing synthesis and fuel gas
- L90 ANSWER 30 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Effect of the method of copper oxide addition on chemisorption properties of zinc-containing sulfur-purification materials
- L90 ANSWER 31 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Process for removing hydrogen sulfide from gas streams
- L90 ANSWER 32 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Preparation of olefin adduct vulcanizing agents for rubbers
- L90 ANSWER 33 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Preparation of elementary sulfur from pyrites of any source and pyritic concentrates, in dry form at atmospheric pressure
- L90 ANSWER 34 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Method for purifying stratal and drainage water of sulfur pits
- L90 ANSWER 35 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI New gas scrubber removes H₂S
- L90 ANSWER 36 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Method of winning of elemental sulfur from sulfur ore
- L90 ANSWER 37 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Winning of pure sulfur from sulfur ore
- L90 ANSWER 38 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Sulfur and calcium carbonate from gypsum
- L90 ANSWER 39 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Desulfurization by three-stage combustion
- L90 ANSWER 40 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Recovery of calcium carbonate and sulfur from FGD scrubber waste
- L90 ANSWER 41 OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Removing hydrogen sulfide from gas streams
- L90 ANSWER 42 OF 54 HCA COPYRIGHT 2004 ACS on STN

TI Conversion of alkali metal sulfate to the **carbonate**

L90 ANSWER (43) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Aqueous **carbonate** process design study

L90 ANSWER (44) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI **Recovering** calcium and **sulfur** compounds from a metallurgical waste material

L90 ANSWER (45) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Rare anthropogenic and natural particles suspended in deep ocean waters

L90 ANSWER (46) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Treatment of an alkali metal sulfide solution

L90 ANSWER (47) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Removal of hydrogen sulfide from natural gas to obtain elemental sulfur

L90 ANSWER (48) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Study of reagent conditions for autoclave melting of sulfur

L90 ANSWER (49) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI **Recovery** of **sulfur** dioxide

L90 ANSWER (50) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Chemistry of the **molten carbonate** process for **sulfur** oxides removal stack gases

L90 ANSWER (51) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Treating **liquid** waste containing **sulfur**

L90 ANSWER (52) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI **Sulfur** from Claus-process off-gases

L90 ANSWER (53) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Converting soda slag from a blast furnace to useful products

L90 ANSWER (54) OF 54 HCA COPYRIGHT 2004 ACS on STN
TI Carbon oxide regenerant for **sulfur** recovery from **molten** salts

=> => d L90 2-7,9,11,13,15-20,22,24,26-28,30-31,33-34,36-54 cbib abs hitind hitstr

L90 ANSWER 2 OF 54 HCA COPYRIGHT 2004 ACS on STN
136:312044 Hydrogen **sulfide** abatement in **molten sulfur**. Schield, John A.; Weers, Jerry J.; Cappel, Weldon J.; Roof, Glenn L. (Baker Hughes Incorporated, USA). Eur. Pat. Appl. EP 1197473 A1 20020417, 15 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-308773 20011015. PRIORITY: US 2000-PV240140 20001013; US 2001-975438 20011009.

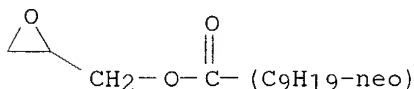
AB The present invention provides a method for inhibiting the evolution of **H₂S** from **sulphydryl** compds. in **molten sulfur** by using scavenging agents such as **anhydrides** and polymers thereof, conjugated ketones, **carbonates**, **epoxides**, monoesters and diesters of unsatd. dicarboxylic acids and polymers of these esters, and the like and mixts. thereof. In one

✓ this case

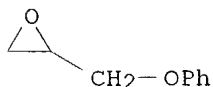
embodiment, it is preferred that the scavenging agent is in **liquid** form at contact temperature with the **molten sulfur**. In another embodiment, the scavenging agent may be atomized into the vapor space over the **molten sulfur** to contact the **sulfur** with the agent.

- IC ICM C01B017-02
CC **49-1** (Industrial Inorganic Chemicals)
ST hydrogen **sulfide** abatement **molten sulfur**
IT Naphthenic acids, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(copper salts, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(dicarboxylic, diesters, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(esters, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT **MerCapto** compounds (inorganic)
RL: MSC (Miscellaneous)
(hydrogen **sulfide** abatement in **molten sulfur**)
IT Naphthenic acids, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(iron salts, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT Fatty acids, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(linseed-oil, epoxidized, Me esters, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT Alcohols, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyhydric, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT **Anhydrides**
Carbonates, uses
Epoxides
Polyanhydrides
RL: TEM (Technical or engineered material use); USES (Uses)
(scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT Fatty acids, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(soya, epoxidized, Me esters, VikoFlex 7010, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT Ketones, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(unsatd., conjugated, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
IT Naphthenic acids, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

- (zinc salts, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
- IT 26761-45-5
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(**Epoxide** 248, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
- IT 122-60-1, Heloxy 63
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(Heloxy 63, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
- IT 7704-34-9P, Sulfur, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(hydrogen **sulfide** abatement in **molten sulfur**)
- IT 7783-06-4, Hydrogen **sulfide**, processes
RL: REM (Removal or disposal); PROC (Process)
(hydrogen **sulfide** abatement in **molten sulfur**)
- IT 108-32-7, Propylene carbonate 123-54-6, 2,4-Pentanedione, uses 138-86-3, Dipentene 2461-15-6, 2-Ethylhexylglycidyl ether 25377-73-5, Dodecenylsuccinic anhydride 26560-94-1
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
- IT 26761-45-5
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(**Epoxide** 248, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
- RN 26761-45-5 HCA
CN Neodecanoic acid, oxiranylmethyl ester (9CI) (CA INDEX NAME)



- IT 122-60-1, Heloxy 63
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(Heloxy 63, scavenging agent; hydrogen **sulfide** abatement in **molten sulfur**)
- RN 122-60-1 HCA
CN Oxirane, (phenoxymethyl)- (9CI) (CA INDEX NAME)



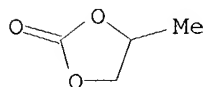
- IT 7704-34-9P, Sulfur, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(hydrogen **sulfide** abatement in **molten sulfur**)

RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

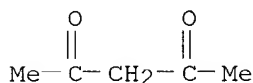
S

IT 108-32-7, Propylene carbonate 123-54-6,
2,4-Pentanedione, uses 2461-15-6, 2-Ethylhexylglycidyl ether
25377-73-5, Dodecenylsuccinic anhydride
26560-94-1
RL: MOA (Modifier or additive use); TEM (Technical or engineered material
use); USES (Uses)
(scavenging agent; hydrogen sulfide abatement in
molten sulfur)

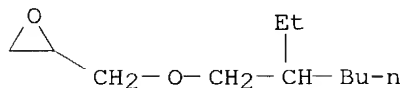
RN 108-32-7 HCA
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 123-54-6 HCA
CN 2,4-Pentanedione (8CI, 9CI) (CA INDEX NAME)



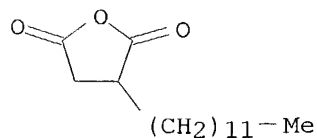
RN 2461-15-6 HCA
CN Oxirane, [[(2-ethylhexyl)oxy]methyl]- (9CI) (CA INDEX NAME)



RN 25377-73-5 HCA
CN 2,5-Furandione, 3-(dodecenyl)dihydro- (9CI) (CA INDEX NAME)

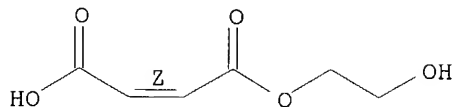
CM 1

CRN 2561-85-5
CMF C16 H28 O3



RN 26560-94-1 HCA
CN 2-Butenedioic acid (2Z)-, mono(2-hydroxyethyl) ester (9CI) (CA INDEX
NAME)

Double bond geometry as shown.



L90 ANSWER 3 OF 54 HCA COPYRIGHT 2004 ACS on STN

135:305979 Process for removing sulfur compounds from hydrocarbon streams.

Pittman, Rusty; Arena, Blaise J.; Janssen, Albert J. (UOP LLC, USA). U.S.

✓ US 6306288 B1 20011023, 6 pp., Cont.-in-part of U.S. Ser. No. 61,661, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1999-426818 19991022. PRIORITY: US 1998-61661 19980417.

AB A process for removing H₂S and mercaptans from a hydrocarbon stream is disclosed. A hydrocarbon stream such as a LPG stream is contacted with a weakly basic stream, e.g., a Na bicarbonate stream to extract the H₂S and mercaptans from the hydrocarbon stream into the basic stream. The basic stream is now treated in a reactor containing a sulfide-oxidizing microorganism to convert the H₂S to S and the mercaptans to disulfides. Finally, the S and disulfides are separated from the basic aqueous stream which can be recycled and used to treat a fresh hydrocarbon stream. The treated hydrocarbon stream is purified to the point that it passes the Cu strip test, while the purified basic stream contains <0.08 g S/L.

IC ICM C10G019-08

ICS C10G019-00; C10G032-00

NCL 208235000

CC 51-4 (Fossil Fuels, Derivatives, and Related Products)

Section cross-reference(s): 49

IT Disulfides

RL: PUR (Purification or recovery); PREP (Preparation)

(recovery in removing of sulfur compds. from hydrocarbon streams)

IT 144-55-8, Sodium bicarbonate, uses 497-19-8, Sodium carbonate, uses 1336-21-6, Ammonium hydroxide

RL: TEM (Technical or engineered material use); USES (Uses) (in removing of sulfur compds. from hydrocarbon streams)

IT 7704-34-9P, Sulfur, preparation

RL: PUR (Purification or recovery); PREP (Preparation)

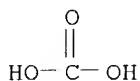
(recovery in removing of sulfur compds. from hydrocarbon streams)

IT 144-55-8, Sodium bicarbonate, uses 497-19-8, Sodium carbonate, uses

RL: TEM (Technical or engineered material use); USES (Uses) (in removing of sulfur compds. from hydrocarbon streams)

RN 144-55-8 HCA

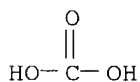
CN Carbonic acid monosodium salt (8CI, 9CI) (CA INDEX NAME)



● Na

RN 497-19-8 HCA

CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

IT 7704-34-9P, Sulfur, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(recovery in removing of sulfur compds. from
hydrocarbon streams)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 4 OF 54 HCA COPYRIGHT 2004 ACS on STN

135:290881 Method for oxidizing hydrogen sulfide to elemental sulfur. Li, Kuo-tseng; Chi, Ren-hai (National Science Council, Taiwan). U.S. US 6299851 B1 20011009, 7 pp., Cont.-in-part of U.S. Ser. No. 277,301. (English). CODEN: USXXAM. APPLICATION: US 1999-334851 19990617. PRIORITY: US 1999-277301 19990326.

AB A method for selectively oxidizing hydrogen sulfide to elemental sulfur is disclosed. The method is performed at 50° to 400° and at a pressure ranged from 0.1 to 50 atmospheric. The elemental sulfur can be effectively recovered from a gas mixture containing hydrogen sulfide in the presence of a catalyst. The catalyst includes a vanadium-containing material and a catalytic substance selected from the group consisting of scandium (Sc), yttrium (Y), lanthanum (La), samarium (Sm) and compds. thereof. In another embodiment, this catalyst further includes an antimony-containing promoter (antimony compds.) which further exhibit a more effective catalytic performance.

IC ICM C01B017-04

NCL 423573100

CC 49-10 (Industrial Inorganic Chemicals)

ST sulfur manuf hydrogen sulfide oxidn catalyst

IT 69-72-7D, Salicylic acid, vanadium complexes 1314-23-4, Zirconia, uses 1327-33-9, Antimony oxide 1344-28-1, Alumina, uses 6218-52-6, Vanadium formate 7439-91-0, Lanthanum, uses 7440-19-9, Samarium, uses 7440-20-2, Scandium, uses 7440-36-0, Antimony, uses 7440-45-1, Cerium, uses 7440-62-2, Vanadium, uses 7440-65-5, Yttrium, uses 7631-86-9, Silica, uses 11099-11-9, Vanadium oxide 11115-67-6, Ammonium vanadate 11130-24-8, Vanadium sulfide 12070-10-9, Vanadium carbide 12627-52-0, Antimony sulfide 12674-04-3, Vanadium nitride 12713-06-3, Vanadium hydride 13463-67-7, Titania, uses 14542-94-0, Vanadium phosphate 14974-48-2, Vanadium oxalate 16785-81-2, Vanadium sulfate 20644-87-5, Vanadium carbonyl 24492-29-3, Vanadium oleate 37353-31-4, Vanadate 39318-26-8, Chromium vanadium oxide 39349-74-1, Antimonate 51891-70-4, Vanadium carbonate 57348-87-5, Vanadium phosphide 63465-09-8, Vanadium acetate 67422-42-8, Antimony carbide 77414-04-1 102857-58-9, Vanadium hydroxide 123782-01-4 132036-01-2 152761-81-4, Antimony hydroxide

259744-19-9 364427-27-0

RL: CAT (Catalyst use); USES (Uses)

(method for oxidizing hydrogen sulfide to elemental sulfur)

IT 7704-34-9P, Sulfur, preparation

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)

(method for oxidizing hydrogen sulfide to elemental sulfur)

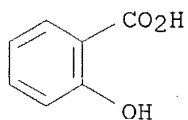
IT 69-72-7D, Salicylic acid, vanadium complexes 14974-48-2, Vanadium oxalate

RL: CAT (Catalyst use); USES (Uses)

(method for oxidizing hydrogen sulfide to elemental sulfur)

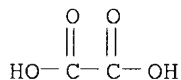
RN 69-72-7 HCA

CN Benzoic acid, 2-hydroxy- (9CI) (CA INDEX NAME)



RN 14974-48-2 HCA

CN Ethanedioic acid, vanadium salt (9CI) (CA INDEX NAME)



●x V(x)

IT 7704-34-9P, Sulfur, preparation

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)

(method for oxidizing hydrogen sulfide to elemental sulfur)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 5 OF 54 HCA COPYRIGHT 2004 ACS on STN

134:254262 Method and composition for removing CO₂ and H₂S from gas mixtures. Chao, I-Meen (Eickmeyer & Associates, USA). PCT Int. Appl. WO 2001019496 A1 20010322, 24 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US25397 20000915. PRIORITY: US 1999-PV154009 19990915.

AB Process is disclosed for removal of CO₂ and H₂S from a sour gas mixture (e.g., natural gas, Fe ore reduction gas). The process uses a continuous absorption process with an alkaline aqueous liquid mixture containing

15-40 weight% of equivalent K_2CO_3 and is conducted at 150-300°F. The **H₂S** is removed from the sour gas as elementary S. CO_2 is stripped from the aqueous alkaline solution and vented directly into the atmospheric since the S that

usually contaminates the CO_2 was removed earlier in the process as elementary S.

IC ICM B01D053-14

ICS B01D053-52

CC 48-1 (Unit Operations and Processes)

Section cross-reference(s): 49, 51

ST carbon dioxide removal gas mixt absorption; hydrogen **sulfide** removal gas mixt absorption; natural gas sweetening absorption

IT Absorption

(for removal of carbon dioxide and hydrogen **sulfide** from gas mixts.)

IT Natural gas, processes

RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PREP (Preparation); PROC (Process)

(removal of carbon dioxide and hydrogen **sulfide** from gas mixts. by absorption)

IT 584-08-7, Potassium **carbonate** 1314-62-1, Vanadium

oxide (V_2O_5), uses 10043-35-3, Boric acid (H_3BO_3), uses

RL: TEM (Technical or engineered material use); USES (Uses)

(in absorption solution for removal of carbon dioxide and hydrogen **sulfide** from gas mixts.)

IT 7704-34-9P, Sulfur, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(recovery in removal of carbon dioxide and hydrogen **sulfide** from gas mixts. by absorption)

IT 124-38-9, Carbon dioxide, processes 7783-06-4, Hydrogen **sulfide**, processes

RL: REM (Removal or disposal); PROC (Process)

(removal from gas mixture by absorption)

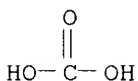
IT 584-08-7, Potassium **carbonate**

RL: TEM (Technical or engineered material use); USES (Uses)

(in absorption solution for removal of carbon dioxide and hydrogen **sulfide** from gas mixts.)

RN 584-08-7 HCA

CN Carbonic acid, dipotassium salt (8CI, 9CI) (CA INDEX NAME)



●2 K

IT 7704-34-9P, Sulfur, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(recovery in removal of carbon dioxide and hydrogen **sulfide** from gas mixts. by absorption)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 124-38-9, Carbon dioxide, processes
RL: REM (Removal or disposal); PROC (Process)
(removal from gas mixture by absorption)
RN 124-38-9 HCA
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

L90 ANSWER 6 OF 54 HCA COPYRIGHT 2004 ACS on STN

133:270762 Study on removal of hydrogen **sulfide** from refinery acid gas by chemical absorption-catalytic oxidation in aqueous solution. Dong, Qun; Wu, Xianchun; Shan, Xilin; Wu, Guanjing; Zhang, Jianguo (Daqing Petroleum Institute, Anda, 151400, Peop. Rep. China). Shiyou Lianzhi Yu Huagong, 31(9), 17-19 (Chinese) 2000. CODEN: SLYHEE. ISSN: 1005-2399. Publisher: Shiyou Lianzhi Yu Huagong Zazhishe.

AB A process for removal of hydrogen **sulfide** from refinery acid gas by wet chemical absorption/catalytic oxidation in a basic solution containing catalyst

was conducted in the laboratory The effects of flow rate ratio of gas/liquid in the absorber, the flow rate of air and the residence time of the basic solution in the regeneration tower on the performance of hydrogen **sulfide** removal from refinery acid gas and elemental S recovery were studied. The test result showed that the said process is expected to be used in refineries for acid gas treatment.

CC 59-4 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 49, 51, 60

ST hydrogen **sulfide** removal refinery acid gas absorption catalytic oxidn; petroleum refinery acid gas wet absorption oxidn **sulfur** recovery

IT Petroleum products
(refinery gases, acid; hydrogen **sulfide** removal from refinery acid gas by wet chemical absorption-catalytic oxidation and **sulfur** recovery)

IT 497-19-8, Sodium **carbonate**, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(absorption by; hydrogen **sulfide** removal from refinery acid gas by wet chemical absorption-catalytic oxidation and **sulfur** recovery)

IT 7772-98-7P, Sodium thiosulfate
RL: BYP (Byproduct); PREP (Preparation)
(hydrogen **sulfide** removal from refinery acid gas by wet chemical absorption-catalytic oxidation and **sulfur** recovery)

IT 7704-34-9P, **Sulfur**, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(hydrogen **sulfide** removal from refinery acid gas by wet chemical absorption-catalytic oxidation and **sulfur** recovery)

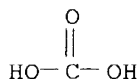
IT 7783-06-4, Hydrogen **sulfide**, processes
RL: REM (Removal or disposal); PROC (Process)
(hydrogen **sulfide** removal from refinery acid gas by wet chemical absorption-catalytic oxidation and **sulfur** recovery)

IT 497-19-8, Sodium **carbonate**, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(absorption by; hydrogen **sulfide** removal from refinery acid

gas by wet chemical absorption-catalytic oxidation and **sulfur**
recovery)

RN 497-19-8 HCA

CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

IT 7704-34-9P, **Sulfur**, preparation

RL: PUR (Purification or recovery); PREP (Preparation)
(hydrogen **sulfide** removal from refinery acid gas by wet chemical
absorption-catalytic oxidation and **sulfur** recovery)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 7 OF 54 HCA COPYRIGHT 2004 ACS on STN

132:37943 **Recovery** of **sulfur** from treated product gases

from gasification of coal or heavy oils. Yoshida, Kunikatsu; Yamada,
Michio; Ueda, Akio; Ueda, Toshiyuki (Babcock-Hitachi K. K., Japan). Jpn.
Kokai Tokkyo Koho JP 11347348 A2 19991221 Heisei, 4 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-154006 19980603.

AB Raw product gases containing H₂S from gasification of coal or heavy oils are
treated by wet scrubbing with water to sep. dust, oxidation of the treated
gases to convert H₂S into SO₂, contacting the gases with an alkali slurry
containing CaCO₃, and further oxidation with divalent metal ions (especially,
Fe²⁺ or
Co²⁺) to convert sulfites into gypsum, and then recovering elemental S (as
gypsum) from the oxidized slurry. In one embodiment, the waste waters
containing divalent metal ions (especially, Fe²⁺ or Co²⁺) from dust during wet
scrubbing can be utilized for increasing the oxidation of CaSO₃ into gypsum.

IC ICM B01D053-50

ICS B01D053-77

CC 51-20 (Fossil Fuels, Derivatives, and Related Products)

Section cross-reference(s): 49

ST **sulfur recovery** raw product coal gasification; gypsum
coal gasification raw product desulfurization

IT Limestone, uses

RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)
(alkali scrubbing solution containing; **recovery** of **sulfur**
from treated product gases from gasification of coal or heavy oils)

IT Fuel oil

(heavy; **recovery** of **sulfur** from treated product
gases from gasification of coal or heavy oils)

IT Coal gasification

(**recovery** of **sulfur** from treated product gases from
gasification of coal or heavy oils)

IT 471-34-1, Calcium **carbonate**, uses

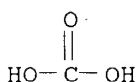
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(alkali scrubbing solution containing; **recovery of sulfur** from treated product gases from gasification of coal or heavy oils)

IT 15438-31-0, Iron ion (Fe²⁺), uses 22541-53-3, Cobalt ion (Co²⁺), uses RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**oxidation by; recovery of sulfur** from treated product gases from gasification of coal or heavy oils)

IT 7704-34-9P, **Sulfur**, preparation 13397-24-5P, Gypsum, preparation
RL: BYP (Byproduct); PREP (Preparation)
(**recovery of sulfur** from treated product gases from gasification of coal or heavy oils)

IT 471-34-1, Calcium **carbonate**, uses
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(alkali scrubbing solution containing; **recovery of sulfur** from treated product gases from gasification of coal or heavy oils)

RN 471-34-1 HCA
CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

IT 7704-34-9P, **Sulfur**, preparation
RL: BYP (Byproduct); PREP (Preparation)
(**recovery of sulfur** from treated product gases from gasification of coal or heavy oils)

RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 9 OF 54 HCA COPYRIGHT 2004 ACS on STN

128:85437 Process for preparing an agent based on **colloidal sulfur** obtained from sulfane for the protection of agricultural plants. Koran, Jiri; Bouska, Petr; Buryan, Petr; Konas, Jiri; Kratochvil, Jiri; Pospisil, Jaroslav; Zacher, Jan (Spolana, Czech Rep.). Czech Rep. CZ 282157 B6 19970514, 4 pp. (Czech). CODEN: CZXXED.
APPLICATION: CZ 1990-6423 19901220.

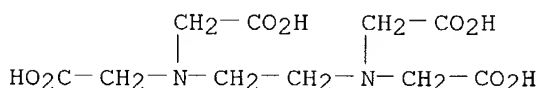
AB A new process for the preparation of **colloid sulfur** fungicides is described. The process eliminates costly energy- and machinery-demanding milling, mixing, and drying associated with uneven sulfur particle size distribution. The process involves formation of a suspension from gaseous sulfan and aqueous solns. of iron complexes. Sulfan (4-6 g/m³) is oxidized to sulfur by the complex formed from FeSO₄·7H₂O, Na EDTA, H₂SO₄, and Na₂CO₃. The sulfur particle size distribution is usually sufficient without further operations. If needed, the resulting mix is milled, sieved (sieve pore size 0.18 x 0.1 mm), and dried in a spray dryer

at 110-140°C. The residues of iron complex solution remaining in the **colloid sulfur** preparation do not need to be removed as they are harmless in the soil/plant environment and may even contribute some nutrients. The suspension containing 40-99.5 mass% sulfur is mixed with 1-55 mass% of a surfactant, 0.1-8 mass% NH_4HCO_3 , and 1-20 mass% of aqueous ammonia (concentration 1-25%). The **colloid sulfur** can be mixed with sulfite solution (surfactant) and ground sulfur (with 3.9% mineral oil) in the preparation of final product. The process can efficiently utilize sulfur byproducts from gas desulfurization.

IC A01N059-02; A01N025-04; C01B017-10
 CC 5-1 (Agrochemical Bioregulators)
 ST **colloid sulfur** prepn sulfan iron complex; fungicide
colloid sulfur prepn sulfan iron
 IT Fungicides
 (**colloidal sulfur** preparation from sulfane for the
 protection of agricultural plants)
 IT 7704-34-9P, Sulfur, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (**colloidal sulfur** preparation from sulfane and iron
 complex for fungicide production)
 IT 139-33-3 497-19-8, Sodium **carbonate**, reactions
 1066-33-7, Ammonium bicarbonate 7439-89-6D, Iron, complexes,
 reactions 7664-41-7, Ammonia, reactions 7664-93-9, Sulfuric acid,
 reactions 7782-63-0, Ferrous sulfate heptahydrate 14265-45-3, Sulfite
 37331-50-3, Sulfane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (**colloidal sulfur** preparation from sulfane for the
 protection of agricultural plants)
 IT 7704-34-9P, Sulfur, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (**colloidal sulfur** preparation from sulfane and iron
 complex for fungicide production)
 RN 7704-34-9 HCA
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

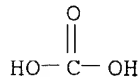
S

IT 139-33-3 497-19-8, Sodium **carbonate**, reactions
 1066-33-7, Ammonium bicarbonate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (**colloidal sulfur** preparation from sulfane for the
 protection of agricultural plants)
 RN 139-33-3 HCA
 CN Glycine, N,N'-1,2-ethanediylbis[N-(carboxymethyl)-, disodium salt (9CI)
 (CA INDEX NAME)



● 2 Na

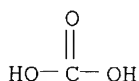
RN 497-19-8 HCA
 CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



● 2 Na

RN 1066-33-7 HCA

CN Carbonic acid, monoammonium salt (8CI, 9CI) (CA INDEX NAME)

● NH₃

- L90 ANSWER 11 OF 54 HCA COPYRIGHT 2004 ACS on STN
126:33989 Manufacture of gypsum from **sulfur** derived from
desulfurization of petroleum products. Shiozawa, Suguru (Kowa Co, Japan).
Jpn. Kokai Tokkyo Koho JP 08283018 A2 **19961029** Heisei, 3 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-110234 19950412.
- AB The process comprises burning **molten S** formed in the
desulfurization to give SO₂, burning the SO₂ with catalysts to give SO₃,
converting the SO₃ to H₂SO₄ by absorption with H₂SO₄, treating the H₂SO₄
with a CaCO₃ slurry to give a CaSO₄ slurry, and dewatering the slurry.
The byproduct S is utilized, and the gypsum obtained is suitable for
cement or gypsum boards.
- IC ICM C01F011-46
- CC **49-5** (Industrial Inorganic Chemicals)
Section cross-reference(s): 51, 58
- ST gypsum manuf petroleum desulfurization **sulfur** recycling; calcium
sulfate manuf petroleum desulfurization **sulfur**
- IT Petroleum refining
(desulfurization; gypsum manufacture from **sulfur** derived from
desulfurization of petroleum products)
- IT Recycling
(gypsum manufacture from **sulfur** derived from desulfurization of
petroleum products)
- IT **7704-34-9P, Sulfur**, preparation
RL: BYP (Byproduct); RCT (Reactant); PREP (Preparation); RACT (Reactant or
reagent)
(gypsum manufacture from **sulfur** derived from desulfurization of
petroleum products)
- IT **7778-18-9P, Calcium sulfate**
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
process); PREP (Preparation); PROC (Process)
(gypsum manufacture from **sulfur** derived from desulfurization of
petroleum products)
- IT **7446-09-5P, Sulfur** dioxide, preparation **7446-11-9P,**
Sulfur trioxide, preparation **7664-93-9P, Sulfuric acid,**
preparation

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (gypsum manufacture from **sulfur** derived from desulfurization of petroleum products)

IT 13397-24-5P, Gypsum, preparation
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (gypsum manufacture from **sulfur** derived from desulfurization of petroleum products)

IT 471-34-1, Calcium **carbonate**, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (gypsum manufacture from **sulfur** derived from desulfurization of petroleum products)

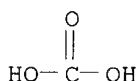
IT 7704-34-9P, **Sulfur**, preparation
 RL: BYP (Byproduct); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (gypsum manufacture from **sulfur** derived from desulfurization of petroleum products)

RN 7704-34-9 HCA
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 471-34-1, Calcium **carbonate**, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (gypsum manufacture from **sulfur** derived from desulfurization of petroleum products)

RN 471-34-1 HCA
 CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



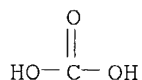
● Ca

L90 ANSWER 13 OF 54 HCA COPYRIGHT 2004 ACS on STN
 124:236405 Elemental **sulfur recovery** from flue gases..
 Kerti, Jozsef; Kerti, Zsolt (Hung.). Hung. Teljes HU 70675 A2
 19951030, 9 pp. (Hungarian). CODEN: HUXXB. APPLICATION: HU
 1992-9203160 19921006.

AB Flue gases from thermal power stations, containing SO₂, are contacted with CaS, CaCO₃, Na₂S, or/and Na₂CO₃ deposited on a porous support at 300-1000° in a reactor. The resulting sulfites are reduced with C, CO, H, and/or natural gas and the elemental S reaction product is condensed in a in a sept. chamber.

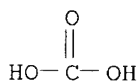
IC ICM B01D053-34
 CC 49-2 (Industrial Inorganic Chemicals)
 Section cross-reference(s): 59
 ST **sulfur recovery** flue gas
 IT Flue gases
 Recycling
 (recovery from thermal power station flue gases, containing SO₂, by

- treating with sulfides and/or **carbonates** and reducing)
- IT Natural gas
RL: NUU (Other use, unclassified); USES (Uses)
(recovery from thermal power station flue gases, containing SO₂, by treating with sulfides and/or **carbonates** and reducing)
- IT **471-34-1, Calcium carbonate**, uses **497-19-8**,
Disodium **carbonate**, uses 630-08-0, Carbon monoxide, uses
1313-82-2, Sodium **sulfide**, uses 1333-74-0, Hydrogen, uses
7440-44-0, Carbon, uses 20548-54-3, Calcium **sulfide**
RL: NUU (Other use, unclassified); USES (Uses)
(recovery from thermal power station flue gases, containing SO₂, by treating with sulfides and/or **carbonates** and reducing)
- IT 7446-09-5, **Sulfur** dioxide, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(recovery from thermal power station flue gases, containing SO₂, by treating with sulfides and/or **carbonates** and reducing)
- IT **7704-34-9P, Sulfur**, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(recovery from thermal power station flue gases, containing SO₂, by treating with sulfides and/or **carbonates** and reducing)
- IT **471-34-1, Calcium carbonate**, uses **497-19-8**,
Disodium **carbonate**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(recovery from thermal power station flue gases, containing SO₂, by treating with sulfides and/or **carbonates** and reducing)
- RN 471-34-1 HCA
CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

- RN 497-19-8 HCA
CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

- IT **7704-34-9P, Sulfur**, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(recovery from thermal power station flue gases, containing SO₂, by treating with sulfides and/or **carbonates** and reducing)
- RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 15 OF 54 HCA COPYRIGHT 2004 ACS on STN
123:321351 Processing of residue from coal **fluidized**-bed
gasification. Herbert, Peter; Reimert, Rainer; Stroeder, Michael
(Metallgesellschaft AG, Germany). Ger. Offen. DE 4410598 A1
19950928, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE
1994-4410598 19940326.

AB A residue (containing coke 8-80, alkaline earth metal **sulfide** (e.g.,
CaS) 2-45, unreacted alkaline earth metal oxide (e.g., CaO) 1-25 weight%, and
ash
balance) from **fluidized**-bed gasification of S-rich coal at
700-1100° in the presence of an alkaline earth metal **carbonate**
or alkaline earth metal oxide for (partial) desulfurization is withdrawn from
the reactor, optionally milled, and mixed with an acid-containing aqueous
solution
(e.g., CO₂, H₂SO₄). After removal of liberated H₂S (which is
used for S manufacture), the residue containing ash, coke, and alkaline earth
metal
salt (e.g., CaCO₃, CaSO₄) is optionally milled and charged into a
flotation zone to sep. coke (which is recycled to gasification) and the
remaining residue containing ash and alkaline earth metal salt. The residue is
dewatered in filter presses, rinsed, filtered again, and disposed.

IC ICM B01D053-34
CC 60-5 (Waste Treatment and Disposal)
Section cross-reference(s): **49**, **51**
ST coal gasification residue processing; coke recycling gasification residue;
sulfur manuf gasification residue
IT Coal gasification
(**fluidized**-bed, processing of residue from)
IT **124-38-9**, Carbon dioxide, reactions 7664-93-9, Sulfuric acid,
reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(in removal of alkaline earth metal **sulfides** from coal
gasification residue)
IT **7704-34-9P**, **Sulfur**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of **sulfur** from hydrogen **sulfide** liberated
during coal gasification residue processing)
IT **471-34-1**, Calcium **carbonate** (CaCO₃), uses 7778-18-9,
Calcium sulfate (CaSO₄)
RL: NUU (Other use, unclassified); USES (Uses)
(processing and disposal of coal gasification residue containing)
IT **124-38-9**, Carbon dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(in removal of alkaline earth metal **sulfides** from coal
gasification residue)
RN **124-38-9** HCA
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

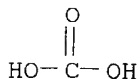
O=C=O

IT **7704-34-9P**, **Sulfur**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of **sulfur** from hydrogen **sulfide** liberated
during coal gasification residue processing)
RN **7704-34-9** HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

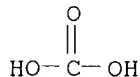
S

IT **471-34-1**, Calcium **carbonate** (CaCO₃), uses
RL: NUU (Other use, unclassified); USES (Uses)
(processing and disposal of coal gasification residue containing)
RN 471-34-1 HCA
CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

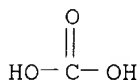
L90 ANSWER 16 OF 54 HCA COPYRIGHT 2004 ACS on STN.
123:117472 Method for recovering sulfur in a wet desulfurization of gases.
Kowalik, Waldemar; Demusiak, Grzegorz (Instytut Gornictwa Naftowego i
Gazownictwa, Pol.). Pol. PL 163962 B1 **19940531**, 4 pp.
(Polish). CODEN: POXXA7. APPLICATION: PL 1990-287799 19901115.
AB The process includes absorbing sulfur contaminants in a solution containing
hydroquinone and sodium **carbonate**, regenerating the absorption
solution by aeration, sedimentation of a sepd.sulfur foam, and filtering
unpurified **sulfur suspension**, followed by repulping
sulfur paste, washing, and filtering the resulting purified
sulfur suspension, from which flotation **sulfur**
is obtained. The absorption is performed at a hydroquinone concentration of
0.4-2.0 g/L, preferably 0.6-1.2 g/L, the regeneration is done at an air
volume flow rate/absorption solution flow rate of (2-10):1, preferably (3-7):1,
and the filtration of unpurified and purified **sulfur**
suspensions is performed at 288-340 K.
IC ICM C01B017-05
ICS B01D053-14
CC **49-1** (Industrial Inorganic Chemicals)
Section cross-reference(s): 51
IT 123-31-9, Hydroquinone, uses **497-19-8**, Sodium **carbonate**
, uses
RL: NUU (Other use, unclassified); USES (Uses)
(absorption solution component; in recovery of sulfur in wet
desulfurization of gases)
IT **7704-34-9P**, Sulfur, preparation
RL: BYP (Byproduct); PUR (Purification or recovery); PREP (Preparation)
(method for recovering sulfur in wet desulfurization of gases)
IT **497-19-8**, Sodium **carbonate**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(absorption solution component; in recovery of sulfur in wet
desulfurization of gases)
RN 497-19-8 HCA
CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

- IT 7704-34-9P, Sulfur, preparation
 RL: BYP (Byproduct); PUR (Purification or recovery); PREP (Preparation)
 (method for recovering sulfur in wet desulfurization of gases)
- RN 7704-34-9 HCA
- CN Sulfur (8CI, 9CI) (CA INDEX NAME)
- S
- L90 ANSWER 17 OF 54 HCA COPYRIGHT 2004 ACS on STN
- 122:294669 Recovery of technical **sulfur** from concentrates resulted from flotation of ores containing **sulfur**. Fodor, Iosif; Puia, Mircea Laurean; Dajbukat, Martin Vasile (Combinatul Minier, Gura Humorului, Rom.). Rom. RO 103905 B1 19940620, 5 pp. (Romanian). CODEN: RUXXA3. APPLICATION: RO 1989-139204 19890412.
- AB To optimize the process and increase S yield, S is **melted** from the concs. containing 45-70% S by heating with live steam under known conditions in a an autoclave without stirring in the presence of ≥0.1% additive (relative to the solid content of the concentrate suspension) comprising preferably a mixture of Na tripolyphosphate and Na2CO3 in a 1.4:1 weight ratio and kerosene for pH control, at a ratio of total solids added to **liquid** 1.2:1.1. The process can be used independent of the source or nature of the starting ore.
- IC ICM C01B017-033
 ICS C01B017-05
- CC 49-1 (Industrial Inorganic Chemicals)
- ST **sulfur** recovery ore flotation conc; sodium tripolyphosphate **sulfur** melt recovery; sodium **carbonate sulfur** melt recovery; kerosene **sulfur** melt recovery
- IT Kerosine
 RL: TEM (Technical or engineered material use); USES (Uses)
 (pH regulator; recovery of tech. **sulfur** from concs. resulted from flotation of ores containing **sulfur**)
- IT Recycling
 (recovery of tech. **sulfur** from concs. resulted from flotation of ores containing **sulfur**)
- IT Ore treatment
 (flotation, concentrate; recovery of tech. **sulfur** from concs. resulted from flotation of ores containing **sulfur**)
- IT 497-19-8, Sodium **carbonate**, uses 7758-29-4, Sodium tripolyphosphate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (pH regulator; recovery of tech. **sulfur** from concs. resulted from flotation of ores containing **sulfur**)
- IT 7704-34-9P, Sulfur, preparation
 RL: PUR (Purification or recovery); PREP (Preparation)
 (recovery of tech. **sulfur** from concs. resulted from flotation

of ores containing **sulfur**)
IT **497-19-8**, Sodium **carbonate**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(pH regulator; recovery of tech. **sulfur** from concs. resulted
from flotation of ores containing **sulfur**)
RN **497-19-8** HCA
CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

IT **7704-34-9P**, **Sulfur**, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(recovery of tech. **sulfur** from concs. resulted from flotation
of ores containing **sulfur**)
RN **7704-34-9** HCA
CN **Sulfur** (8CI, 9CI) (CA INDEX NAME)

S

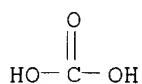
L90 ANSWER 18 OF 54 HCA COPYRIGHT 2004 ACS on STN
122:191588 Flue Gas Desulfurization Scheme To **Recover** Elemental
Sulfur. Sell, Nancy J.; Norman, Jack C.; Ciriacks, John A.
(Department of Natural and Applied Sciences, University of Wisconsin,
Green Bay, WI, 54311-7001, USA). Industrial & Engineering Chemistry
Research, 34(4), 1428-33 (English) 1995. CODEN: IECRED. ISSN:
0888-5885. Publisher: American Chemical Society.
AB A sodium-based flue gas desulfurization process, employing reductive
burning and a Claus recovery system, has the advantage of producing
elemental sulfur as a byproduct. This study optimized the process
conditions for two steps in the proposed reaction scheme: (1) removing
approx. one-sixth of the sulfur in the spent scrubbing liquor by a
combination of acidification and evaporation and (2) precipitation of 50% of
the
remaining Na₂SO₃ (s) by the addition of NaHCO₃/Na₂CO₃ slurry. Several
combinations of process conditions can be used to produce favorable
results, but the optimum from a tech. perspective is to add concentrated H₂SO₄
to the spent liquor to 1.5% volume/volume, concentrate the mixture to 70% by
weight, and
then treat it with a >70% solids slurry of NaHCO₃/Na₂CO₃. The optimum
from an economic perspective is dependent on the relative costs of H₂SO₄
and the steam needed to concentrate the spent liquor.
CC **49-1** (Industrial Inorganic Chemicals)
Section cross-reference(s): 59
ST flue gas desulfurization **sulfur recovery**
IT Flue gases
(sodium-based flue gas desulfurization process to **recover**
sulfur)
IT **144-55-8**, Sodium bicarbonate, uses **497-19-8**, Sodium
carbonate, uses **7664-93-9**, Sulfuric acid, uses

RL: NUU (Other use, unclassified); USES (Uses)
(sodium-based flue gas desulfurization process to **recover sulfur**)

IT 7704-34-9P, Sulfur, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(sodium-based flue gas desulfurization process to **recover sulfur**)

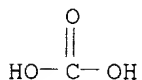
IT 144-55-8, Sodium bicarbonate, uses 497-19-8, Sodium carbonate, uses
RL: NUU (Other use, unclassified); USES (Uses)
(sodium-based flue gas desulfurization process to **recover sulfur**)

RN 144-55-8 HCA
CN Carbonic acid monosodium salt (8CI, 9CI) (CA INDEX NAME)



● Na

RN 497-19-8 HCA
CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

IT 7704-34-9P, Sulfur, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(sodium-based flue gas desulfurization process to **recover sulfur**)

RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 19 OF 54 HCA COPYRIGHT 2004 ACS on STN
121:86868 Process for **recovering sulfur** from carbon dioxide- and hydrogen sulfide-containing acid gas mixtures. Towler, Gavin P.; Lynn, Scott (University of California, USA). PCT Int. Appl. WO 9413579 A1 **19940623**, 18 pp. DESIGNATED STATES: W: AT, AU, BB, BG, BR, BY, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, VN; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2.
APPLICATION: WO 1993-US11927 19931208. PRIORITY: US 1992-991163 19921216.

AB The process comprises contacting the gas at $\geq 700^\circ$ with

- a catalyst that enhances the thermal dissociation of H₂S to H₂ and S₂. The equilibrium of the thermal decomposition of H₂S is shifted by the equilibration of the water-gas-shift reaction so as to favor the formation of elemental S. The primary products of the overall reaction are S₂, CO, H₂ and H₂O. Small amts. of COS, SO₂ and CS₂ may also be formed. Rapid quenching of the reaction mixture to ≤600° results in a substantial increase in the efficiency of the conversion of H₂S to S. Plant economy is further advanced by treating the product gases to remove byproduct COS by hydrolysis, whereby the COS is converted back to CO₂ and H₂S.
- IC ICM C01B017-04
ICS C01B017-16; C01B031-20; C01B031-26
- CC **49-1** (Industrial Inorganic Chemicals)
Section cross-reference(s): 51
- IT Natural gas
RL: USES (Uses)
(carbon dioxide- and hydrogen **sulfide**-containing, **sulfur recovery** from)
- IT Transition metal sulfides
RL: CAT (Catalyst use); USES (Uses)
(decomposition catalysts, for **sulfur recovery** from carbon dioxide- and hydrogen sulfide-containing acid gas mixts.)
- IT Alcohols, properties
RL: PRP (Properties)
(C1-4, amino, solns. containing potassium **carbonate** and, absorption in, of hydrogen **sulfide**, in **sulfur recovery** from carbon dioxide- and hydrogen sulfide-containing acid gas mixts.)
- IT Alcohols, properties
RL: PRP (Properties)
(C1-4, iminodi-, solns. containing potassium **carbonate** and, absorption in, of hydrogen **sulfide**, in **sulfur recovery** from carbon dioxide- and hydrogen sulfide-containing acid gas mixts.)
- IT 1315-03-3, Vanadium sulfide (V₂S₃) 1317-33-5, Molybdenum disulfide, uses
12018-22-3, Chromium sulfide (Cr₂S₃) 12138-09-9, Tungsten disulfide
RL: CAT (Catalyst use); USES (Uses)
(decomposition catalyst, for **sulfur recovery** from carbon dioxide- and hydrogen sulfide-containing acid gas mixts.)
- IT 7783-06-4, Hydrogen sulfide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(decomposition of, in presence of carbon dioxide, into hydrogen and **sulfur**, in natural gas **purification**)
- IT **7704-34-9P**, Sulfur, preparation
RL: PREP (Preparation)
(formation of hydrogen and, by hydrogen sulfide decomposition in natural gas purification)
- IT **124-38-9**, Carbon dioxide, uses
RL: USES (Uses)
(gas mixts. containing hydrogen **sulfide** and, **sulfur recovery** from)
- IT 463-58-1, Carbonyl sulfide
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrolysis of, for carbon dioxide and hydrogen **sulfide**, in **sulfur recovery** from carbon dioxide- and hydrogen sulfide-containing acid gas mixts.)
- IT **584-08-7P**, Potassium **carbonate**
RL: PREP (Preparation)

(solns. containing alkanolamines and dialkanolamines and, absorption in, of hydrogen sulfide, in **sulfur recovery** from carbon dioxide- and hydrogen sulfide-containing acid gas mixts.)

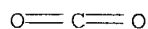
IT **7704-34-9P**, Sulfur, preparation
RL: PREP (Preparation)
(formation of hydrogen and, by hydrogen sulfide decomposition in natural gas purification)

RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

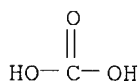
IT **124-38-9**, Carbon dioxide, uses
RL: USES (Uses)
(gas mixts. containing hydrogen sulfide and, **sulfur recovery** from)

RN 124-38-9 HCA
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)



IT **584-08-7P**, Potassium carbonate
RL: PREP (Preparation)
(solns. containing alkanolamines and dialkanolamines and, absorption in, of hydrogen sulfide, in **sulfur recovery** from carbon dioxide- and hydrogen sulfide-containing acid gas mixts.)

RN 584-08-7 HCA
CN Carbonic acid, dipotassium salt (8CI, 9CI) (CA INDEX NAME)



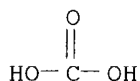
●2 K

L90 ANSWER 20 OF 54 HCA COPYRIGHT 2004 ACS on STN
119:274498 **Purification of sulfur.** Ma, Yongming; Han, Yuying; Yan, Yixin (Shanxi University, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1073657 A **19930630**, 5 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 1991-111804 19911222.

AB The process comprises placing the S-containing material in a vessel heated at 115-445°, introducing water or steam into the vessel to form a gas mixture containing S and water, cooling the gas mixture to precipitate S, and washing and drying the S. Additive corresponding to 0.01-10% of the S content in the S-containing material may be added to the system for increased efficiency, and the additive is NH₃, urea or NH₄ salt of a nonoxidizing acid selected from ≥1 of (NH₄)₂CO₃, NH₄HCO₃, NH₄Cl, NH₄H₂PO₄, (NH₄)₂HPO₄. The S-containing material is industrial S with high As content, or recovered crude S from industries. The steam is may be superheated steam.

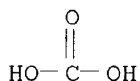
IC ICM C01B017-02
CC **49-1** (Industrial Inorganic Chemicals)

ST **sulfur purifn**
IT Steam
(purification with, of crude **sulfur**, additives for, for increased efficiency)
IT 57-13-6, Urea, uses **506-87-6**, Ammonium **carbonate** **1066-33-7**, Ammonium bicarbonate 7664-41-7, Ammonia, uses 7722-76-1 7783-28-0, Ammonium phosphate, dibasic 12125-02-9, Ammonium chloride, uses
RL: USES (Uses)
(additive, in **sulfur purification** by steam-treating, for increased efficiency)
IT **7704-34-9P**, **Sulfur**, preparation
RL: PREP (Preparation)
(purification of crude, by steam-treating, additives for increased efficiency in)
IT 7440-38-2, Arsenic, miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from industrial **sulfur**, in **sulfur purification**)
IT 7732-18-5
RL: USES (Uses)
(steam, **purification** with, of crude **sulfur**, additives for, for increased efficiency)
IT **506-87-6**, Ammonium **carbonate** **1066-33-7**, Ammonium bicarbonate
RL: USES (Uses)
(additive, in **sulfur purification** by steam-treating, for increased efficiency)
RN 506-87-6 HCA
CN Carbonic acid, diammonium salt (8CI, 9CI) (CA INDEX NAME)



●2 NH₃

RN 1066-33-7 HCA
CN Carbonic acid, monoammonium salt (8CI, 9CI) (CA INDEX NAME)

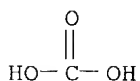


● NH₃

IT **7704-34-9P**, **Sulfur**, preparation
RL: PREP (Preparation)
(purification of crude, by steam-treating, additives for increased efficiency in)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

- L90 ANSWER 22 OF 54 HCA COPYRIGHT 2004 ACS on STN
116:27118 Removal and **recovery** of **sulfur** dioxide from waste gases, especially from metallurgical plants, and from flue gases. Matschiner, Hermann; Kain, Christoph; Haase, Rudolf; Maschmeier, Claus Peter (Martin-Luther-Universitaet Halle-Wittenberg, Germany). Ger. (East) DD 293999 A5 **19910919**, 4 pp. (German). CODEN: GEXXA8. APPLICATION: DD 1989-334815 19891124.
- AB SO₂ is removed from flue or waste gases by scrubbing with a sec. amine, e.g., dimethylamine, at 30-80°. The SO₂-amine adducts are used to manufacture sulfites or bisulfites by reaction with aqueous alkali hydroxides, **carbonates**, or bicarbonates. Addnl. S may be used to manufacture thiosulfates. The adduct may be reacted with H₂S to form S. The amine is recovered for recycling.
- IC ICM C01B017-60
ICS C01B017-62; C01B017-98; C01B017-64; B01D053-34
CC 59-4 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): **49**, **55**, **56**
- ST **sulfur** dioxide **recovery** flue gas; sulfite manuf sulfur dioxide waste; bisulfite manuf sulfur dioxide waste; thiosulfate manuf sulfur dioxide waste; sulfur manuf sulfur dioxide waste
- IT 1310-73-2, Sodium hydroxide, uses
RL: USES (Uses)
(in **recovery** of **sulfur** compds. from waste gases containing sulfur dioxide, dimethylamine in)
- IT 7783-06-4, Hydrogen **sulfide**, uses
RL: USES (Uses)
(in **recovery** of **sulfur** from waste gases containing sulfur dioxide, dimethylamine in)
- IT 124-40-3, Dimethylamine, uses
RL: USES (Uses)
(in removal and **recovery** of **sulfur** dioxide from waste gases)
- IT **463-79-6DP**, Carbonic acid, alkali salts **7704-34-9P**, **Sulfur**, preparation 7772-98-7P, Sodium thiosulfate 7782-99-2DP, Sulfurous acid, alkali metal salts 13686-28-7DP, Thiosulfuric acid, alkali metal salts
RL: PREP (Preparation)
(**recovery** of, from waste gases containing sulfur dioxide, dimethylamine in)
- IT **463-79-6DP**, Carbonic acid, alkali salts **7704-34-9P**, **Sulfur**, preparation
RL: PREP (Preparation)
(**recovery** of, from waste gases containing sulfur dioxide, dimethylamine in)
- RN 463-79-6 HCA
CN Carbonic acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 24 OF 54 HCA COPYRIGHT 2004 ACS on STN

113:117877 Manufacture of sublimed amorphous **sulfur**. Krajewski, Jan; Gatarz, Zdzislaw; Dojka, Marian; Krawczyk, Boguslaw; Pantula, Zbigniew; Warzybok, Jozef; Malarz, Janusz; Kopec, Jozef (Osrodek Badawczo-Rozwojowy Przemyslu Siarkowego "Siarkopol", Pol.). Pol. PL 148229 B1 **19890930**, 5 pp. Abstracted and indexed from the unexamined application. (Polish). CODEN: POXXA7. APPLICATION: PL 1987-268208 19871013.

AB S-containing air from S mines is introduced into absorption column and S vapor is contacted with counter current-sprayed **liquid**, preferably aqueous inorg. salts with alkaline reaction, and the resulting S suspension is separated

by known methods, washed, filtered and dried to obtain fine S powder having globular shape.

IC ICM C01B017-10

CC **49-1** (Industrial Inorganic Chemicals)

ST amorphous **sulfur** manuf

IT **7704-34-9P, Sulfur**, preparation

RL: PREP (Preparation)

(manufacture of amorphous)

IT **497-19-8, Sodium carbonate**, uses and miscellaneous

RL: USES (Uses)

(sprayable **liquid** containing, in **sulfur** manufacture by resublimation)

IT **7704-34-9P, Sulfur**, preparation

RL: PREP (Preparation)

(manufacture of amorphous)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

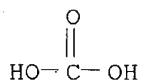
IT **497-19-8, Sodium carbonate**, uses and miscellaneous

RL: USES (Uses)

(sprayable **liquid** containing, in **sulfur** manufacture by resublimation)

RN 497-19-8 HCA

CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

L90 ANSWER 26 OF 54 HCA COPYRIGHT 2004 ACS on STN

112:215619 Production of water-**suspendable liquid** or solid

sulfur concentrates. Teren, Jan; Nadvornik, Robert; Hutar, Eduard; Stanik, Vojtech (Czech.). Czech. CS 250858 B1 **19880815**, 8 pp. (Slovak). CODEN: CZXXA9. APPLICATION: CS 1983-5514 19830725.

AB Molten S is emulsified in sulfite waste liquor and/or a lignosulfonic acid salt containing ≥ 1 Ca²⁺, Mg²⁺, Fe²⁺, Fe³⁺, Cu²⁺, Mn²⁺, Zn²⁺, Co²⁺, and TiO₂+. Optionally, the sulfite waste liquor is preheated to 65-105°. The S concentrate is a fertilizer. A concentrate was prepared by mixing concentrated sulfite waste liquor (dry matter 52.7%), 546.2, MgSO₄·7H₂O 93.9, and H₂O 72.1 g, at 85°. After settling, the solution (499.7 g) was preheated to 95-105°, and molten S 283.1 g was added. After drying, the solid concentrate contained total S 56.34, total Mg 1.41, water-soluble Mg 1.40, and total Ca 0.30 weight%.

IC ICM C01B017-00

CC 19-6 (Fertilizers, Soils, and Plant Nutrition)

IT **7704-34-9P**, Sulfur, biological studies
RL: AGR (Agricultural use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(fertilizer, manufacture of, by emulsification of melt, in sulfite waste liquid and/or lignosulfonate)

IT **546-46-3**, Zinc citrate **546-93-0**, Magnesium carbonate (MgCO₃) 1309-48-4, Magnesia (MgO), biological studies 7439-89-6D, Iron, salts 7439-96-5D, Manganese, salts 7440-32-6D, Titanium, salts 7440-48-4D, Cobalt, salts 7440-50-8D, Copper, salts 7440-66-6D, Zinc, salts 7487-88-9, Sulfuric acid magnesium salt (1:1), biological studies 7720-78-7 7733-02-0, Zinc sulfate (ZnSO₄) 7758-98-7, Sulfuric acid copper(2+) salt (1:1), biological studies 8062-15-5D, Lignosulfonic acid, salts 12519-36-7, Zinc EDTA 15498-89-2
RL: BIOL (Biological study)
(in sulfur fertilizer concentrate manufacture)

IT **7704-34-9P**, Sulfur, biological studies
RL: AGR (Agricultural use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(fertilizer, manufacture of, by emulsification of melt, in sulfite waste liquid and/or lignosulfonate)

RN 7704-34-9 HCA

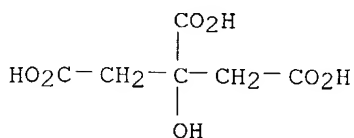
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT **546-46-3**, Zinc citrate **546-93-0**, Magnesium carbonate (MgCO₃)
RL: BIOL (Biological study)
(in sulfur fertilizer concentrate manufacture)

RN 546-46-3 HCA

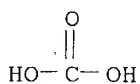
CN 1,2,3-Propanetricarboxylic acid, 2-hydroxy-, zinc salt (2:3) (9CI) (CA INDEX NAME)



● 3/2 Zn

RN 546-93-0 HCA

CN Carbonic acid, magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



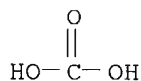
● Mg

- L90 ANSWER 27 OF 54 HCA COPYRIGHT 2004 ACS on STN
 112:23522 MHD seed recovery and regeneration. McIlroy, R. A.; Probert, P. B.; Jackson, D. M.; Lahoda, E. J. (Babcock and Wilcox Co., USA). Proceedings of the Intersociety Energy Conversion Engineering Conference, 24th (Vol. 2), 1025-31 (English) 1989. CODEN: PIECDE. ISSN: 0146-955X.
- AB A process is described for regeneration of K₂CO₃ seed from spent material recovered as K₂SO₄ from the residues of coal-fired MHD generators; the process is based on reduction of SO₄²⁻ followed by separation of S and K. Reduction is carried out in a rotary kiln by combustion of K₂SO₄-coal mixts. (2:1) at 700°; K₂S₂ forms and is dissolved to form a green liquor which is clarified and then **carbonated** to H₂S and K₂CO₃, by a modified Tampella process. The H₂S is converted to elemental S using the Claus process; K₂CO₃ is purified by crystallization to 95% purity, with Na and Cl as main impurities. The flue gas from the kiln is treated in scrubbers to **recover H₂S**; the plant also has waste heat recovery systems to improve the energy balance.
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49, 51, 59
- ST potassium **carbonate** seed MHD recovery; MHD generator potassium seed recovery; redn potassium sulfate coal kiln; carbonation potassium MHD seed recovery; flue gas potassium sulfate redn; waste heat MHD seed recovery
- IT Air pollution
 (by flue gases, from potassium sulfate-coal combustion, in potassium **carbonate** MHD seed recovery process, abatement of)
- IT Flue gases
 (from potassium sulfate-coal combustion, in potassium **carbonate** MHD seed recovery process, cleaning of)
- IT Ashes (residues)
 (from potassium sulfate-coal combustion, in potassium **carbonate** MHD seed recovery process, disposal of)
- IT Reduction

- (of potassium sulfate, by coal, in rotary kiln, for potassium **carbonate** MHD generator seed recovery)
- IT Electric generators
(MHD, potassium **carbonate** seed for, recovery of, reduction/carbonation process for)
- IT Heat
(waste, recovery of, from potassium sulfate-coal combustion, in potassium **carbonate** MHD seed recovery process)
- IT 7783-06-4P, Hydrogen sulfide, preparation
RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(formation and decomposition of, **sulfur recovery** by, in **recovery**/regeneration of potassium **carbonate**, for MHD generator seed)
- IT 7704-34-9P, Sulfur, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in recovery of potassium **carbonate**, for MHD generator seed)
- IT 584-08-7P, Potassium **carbonate** (K₂CO₃)
RL: PREP (Preparation)
(recovery of, potassium sulfate reduction/carbonation process for, for MHD generator seed)
- IT 7778-80-5, Potassium sulfate (K₂SO₄), reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction of, by coal, in rotary kiln, for potassium **carbonate** MHD generator seed recovery)
- IT 7704-34-9P, Sulfur, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in recovery of potassium **carbonate**, for MHD generator seed)
- RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

- IT 584-08-7P, Potassium **carbonate** (K₂CO₃)
RL: PREP (Preparation)
(recovery of, potassium sulfate reduction/carbonation process for, for MHD generator seed)
- RN 584-08-7 HCA
CN Carbonic acid, dipotassium salt (8CI, 9CI) (CA INDEX NAME)



● 2 K

L90 ANSWER 28 OF 54 HCA COPYRIGHT 2004 ACS on STN
111:197844 Process for removal of hydrogen sulfide from sour gas streams.
Byers, Dallas L. (Shell Oil Co., USA). U.S. US 4840782 A
19890620, 9 pp. Cont. of U.S. Ser. No. 937,446, abandoned.
(English). CODEN: USXXAM. APPLICATION: US 1987-139140 19871221.
PRIORITY: US 1984-614363 19840529; US 1985-790763 19851023; US 1986-937446

19861205.

AB H2S is removed from sour gas by contacting the sour gas stream in a contacting zone with an aqueous reaction solution substantially free of anthraquinone disulfonate (<0.2 g/L) and containing an effective amount of V5+ ions to oxidize H2S, producing a sweet gas stream and an aqueous solution containing

solid S and V4+ ions. The reaction solution has a pH of 8-11 and also contains an amount of phosphate ions sufficient to provide a molar ratio of phosphate ions to V4+ ions ≥ 0.1 . The solid S is removed from the aqueous solution and the remaining aqueous solution is regenerated and

recycled.

IC ICM C01B017-05

NCL 423576600

CC 48-1 (Unit Operations and Processes)

Section cross-reference(s): 49, 51

IT Fuel gases

Natural gas

RL: USES (Uses)

(hydrogen sulfide removal from, by oxidation with solution containing vanadium ions and phosphate ions)

IT 107-70-0 108-10-1, Methyl isobutyl ketone 108-32-7, Propylene carbonate 108-94-1, Cyclohexanone, uses and miscellaneous 110-13-4, 2,5-Hexanedione 111-46-6, Diethylene glycol, uses and miscellaneous 111-90-0, Diethylene glycol monoethyl ether 112-60-7, Tetraethylene glycol 123-42-2, Diacetone alcohol 123-54-6, 2,4-Pentanedione, uses and miscellaneous 126-33-0, Sulfolane 141-79-7, Mesityl oxide 142-92-7, Hexyl acetate 143-24-8, Tetraethylene glycoldimethyl ether 872-50-4, N-Methyl pyrrolidone, uses and miscellaneous

RL: USES (Uses)

(absorbent, for removal of hydrogen sulfide from sour gas streams)

IT 7704-34-9P, Sulfur, preparation

RL: FORM (Formation, nonpreparative); PREP (Preparation)

(formation of, from hydrogen sulfide oxidation with vanadium ion containing solution, in sour gas treatment)

IT 7632-05-5, Sodium phosphate 10124-31-9, Ammonium phosphate 10377-52-3, Lithium phosphate 11105-06-9, Sodium vanadate 11115-67-6, Ammonium vanadate 11126-15-1, Lithium vanadium oxide 11126-20-8, Potassium vanadate 16068-46-5, Potassium phosphate

RL: USES (Uses)

(in removal of hydrogen sulfide by oxidation, from sour gas streams)

IT 124-38-9, Carbon dioxide, uses and miscellaneous

RL: REM (Removal or disposal); PROC (Process)

(removal of, from sour gas containing hydrogen sulfide)

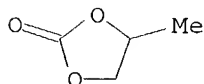
IT 108-32-7, Propylene carbonate 110-13-4, 2,5-Hexanedione 123-54-6, 2,4-Pentanedione, uses and miscellaneous

RL: USES (Uses)

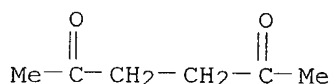
(absorbent, for removal of hydrogen sulfide from sour gas streams)

RN 108-32-7 HCA

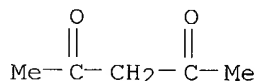
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 110-13-4 HCA
CN 2,5-Hexanedione (8CI, 9CI) (CA INDEX NAME)



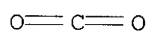
RN 123-54-6 HCA
CN 2,4-Pentanedione (8CI, 9CI) (CA INDEX NAME)



IT 7704-34-9P, Sulfur, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, from hydrogen **sulfide oxidation** with
vanadium ion containing solution, in sour gas treatment)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

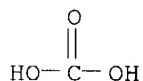
IT 124-38-9, Carbon dioxide, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from sour gas containing hydrogen sulfide)
RN 124-38-9 HCA
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)



L90 ANSWER 30 OF 54 HCA COPYRIGHT 2004 ACS on STN
109:112575 Effect of the method of copper oxide addition on chemisorption
properties of zinc-containing **sulfur-purification**
materials. Dantsig, G. A.; Grechenko, A. N.; Grigorev, V. V.; Serova, L.
P.; Yagodkina, G. N. (Gos. Inst. Azotn. Prom. Prod. Org. Sint.,
Novomoskovsk, USSR). Zhurnal Prikladnoi Khimii (Sankt-Peterburg, Russian
Federation), 61(6), 1240-6 (Russian) 1988. CODEN: ZPKHAB.
ISSN: 0044-4618.

AB The chemisorption of H₂S and other S-containing materials on S-purification
agents
(oxides, e.g., GIAP-10-2) occurs 50-70° lower than on activated
ZnO. The effect of CuO on the sorption properties of S-purification agents was
studied using a mixture of basic **carbonates** of Zn and Cu and a
mixture of ZnO and CuO treated with (NH₄)₂CO₃. The presence of Cu in the
mixture significantly enhanced the decomposition of H₂S before chemisorption.
The (NH₄)₂CO₃ treatment of CuO and ZnO resulted in the formation of double
salts, which, after being reduced by H₂, facilitated the introduction of
Cu into the ZnO lattice. The Cu in the S-purification agents acts as a
promoter, enhancing the reaction between H₂S and ZnO.
CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 49
ST copper oxide hydrogen sulfide sorbent; zinc oxide hydrogen sulfide

- sorbent; **sulfur purifn** material hydrogen
sulfide sorbent
- IT 1317-38-0, Copper oxide, uses and miscellaneous
 RL: USES (Uses)
 (chemisorption of hydrogen sulfide on zinc-containing **sulfur-**
purification agents in relation to)
- IT 7783-06-4, Hydrogen sulfide, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (chemisorption of, on zinc-containing **sulfur-purification**
 agents, copper oxide effect on)
- IT 506-87-6, Ammonium **carbonate**
 RL: USES (Uses)
 (in preparation of zinc oxide, for **purification** of **sulfur**)
- IT 7704-34-9P, **Sulfur**, preparation
 RL: PUR (Purification or recovery); PREP (Preparation)
 (purification of, zinc-containing agent for, hydrogen sulfide
 chemisorption by)
- IT 506-87-6, Ammonium **carbonate**
 RL: USES (Uses)
 (in preparation of zinc oxide, for **purification** of **sulfur**)
- RN 506-87-6 HCA
 CN Carbonic acid, diammonium salt (8CI, 9CI) (CA INDEX NAME)



● 2 NH₃

- IT 7704-34-9P, **Sulfur**, preparation
 RL: PUR (Purification or recovery); PREP (Preparation)
 (purification of, zinc-containing agent for, hydrogen sulfide
 chemisorption by)
- RN 7704-34-9 HCA
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

- L90 ANSWER 31 OF 54 HCA COPYRIGHT 2004 ACS on STN
 109:60724 Process for removing hydrogen sulfide from gas streams. De Haan,
 Robert; Dry, Mark Eberhard; Dressler, Flemming Hermann; Hesse, Horst
 Joachim Franz August (Sasol Operations (Pty.) Ltd., S. Afr.). S. African
 ZA 8703112 A 19871230, 25 pp. (English). CODEN: SFXAB.
 APPLICATION: ZA 1987-3112 19870430. PRIORITY: ZA 1986-3264 19860501.
- AB H₂S is removed from waste gases by scrubbing with an alkaline solution
 containing
 oxovanadium (V), with alkalinity present as OH⁻, CO₃²⁻, and HCO₃⁻ to maintain
 the pH at 7.4-9 where CO₃²⁻ in <12.5 g/L. The oxovanadium (IV) produced
 from S oxidation can be oxidized to the pentavalent form by bubbling an
 O-containing gas through the scrubbing solution A scrubbing solution
 containing
 pentavalent V 1.9, Na₂CO₃ 40, diethanol amine 40, and NaSCN 20 g/L was
 used to remove 97.7% of H₂O present at 1% in CO₂, for a solution loading of

300 mg H₂S/L. The S formed was recovered from froth in the oxidizer.

IC ICM C01B
ICS B01D; C07C; C01G

CC 59-4 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 49

ST hydrogen sulfide scrubbing waste gas; **sulfur recovery**
hydrogen **sulfide** scrubbing; vanadium pentoxide hydrogen sulfide scrubbing

IT 16408-26-7
RL: OCCU (Occurrence)
(hydrogen sulfide removal from gas by scrubbing with, with **sulfur recovery**)

IT 7704-34-9P, **Sulfur**, preparation
RL: PREP (Preparation)
(**recovery** of, in hydrogen **sulfide** scrubbing from gas with vanadium pentoxide)

IT 7783-06-4, Hydrogen sulfide, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from gas, scrubbing with vanadium pentoxide for, **sulfur recovery** in)

IT 111-42-2, Diethanol amine, uses and miscellaneous 497-19-8, Sodium **carbonate**, uses and miscellaneous 540-72-7, Sodium thiocyanate
RL: USES (Uses)
(scrubbing solution containing, for hydrogen sulfide removal from gas)

IT 7704-34-9P, **Sulfur**, preparation
RL: PREP (Preparation)
(**recovery** of, in hydrogen **sulfide** scrubbing from gas with vanadium pentoxide)

RN 7704-34-9 HCA

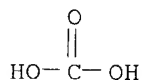
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 497-19-8, Sodium **carbonate**, uses and miscellaneous
RL: USES (Uses)
(scrubbing solution containing, for hydrogen sulfide removal from gas)

RN 497-19-8 HCA

CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

L90 ANSWER 33 OF 54 HCA COPYRIGHT 2004 ACS on STN
107:239266 Preparation of elementary **sulfur** from pyrites of any source and pyritic concentrates, in dry form at atmospheric pressure. Saddy, Maury (Centro de Tecnologia Promon-CTP, Brazil). Braz. Pedido PI BR 8506126 A 19870630, 6 pp. (Portuguese). CODEN: BPXXDX.
APPLICATION: BR 1985-6126 19851206.

AB The title process includes thermal decomposition of pyrite in a

fluidized bed at 400-1200° to produce S by condensation of S vapor as well as a mixture of pyrrhotite and diverse residues, magnetic separation of the pyrrhotite from the other residues for recycling as a feed to the **fluidized** bed, operating with an excess of air at 400-1200° to produce Fe₂O₃ and SO₂. Fuel is fed to a combustion reactor in the **fluidized** bed, operating with 20% excess air at 600-1200°, and 100% excess CaCO₃ is added to react with the toxic SO₂ to produce CaSO₄, CaO, and CO₂. The heat of the gases from combustion and roasting may be partially used in the 1st and 2nd stages of the process for drying and thermal decomposition

- IC ICM C22B001-10
ICS C01B017-00
- CC **49-1** (Industrial Inorganic Chemicals)
- ST **sulfur** prodn pyrite thermal decompn; ferric oxide byproduct
sulfur prodn; calcium sulfate byproduct **sulfur** prodn;
calcium oxide byproduct **sulfur** prodn; carbon dioxide formation
sulfur prodn
- IT 1310-50-5P, Pyrrhotite
RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(formation and thermal decomposition of, in **sulfur** production from pyrite)
- IT 1309-37-1P, Ferric oxide, preparation 7446-09-5P, **Sulfur**
dioxide, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in thermal decomposition of pyrrhotite, in **sulfur** production from pyrite)
- IT **124-38-9P**, Carbon dioxide, preparation 1305-78-8P, Calcium
oxide, preparation 7778-18-9P, Calcium sulfate
RL: PREP (Preparation)
(formation, of, by calcium **carbonate** reaction with
sulfur dioxide from pyrrhotite thermal decomposition in
sulfur production from pyrite)
- IT **7704-34-9P**, **Sulfur**, preparation
RL: PREP (Preparation)
(production of, from pyrite, by thermal decomposition)
- IT **471-34-1P**, Calcium **carbonate**, reactions
RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(reaction of, with **sulfur** dioxide from pyrrhotite thermal
decomposition in **sulfur** production from pyrite)
- IT 1309-36-0P, Pyrite, reactions
RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(thermal decomposition of, **sulfur** production and pyrrhotite formation
by)
- IT **124-38-9P**, Carbon dioxide, preparation
RL: PREP (Preparation)
(formation, of, by calcium **carbonate** reaction with
sulfur dioxide from pyrrhotite thermal decomposition in
sulfur production from pyrite)
- RN 124-38-9 HCA
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

- IT **7704-34-9P**, **Sulfur**, preparation
RL: PREP (Preparation)
(production of, from pyrite, by thermal decomposition)
- RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

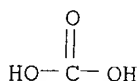
S

IT 471-34-1P, Calcium carbonate, reactions

RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(reaction of, with sulfur dioxide from pyrrhotite thermal
decomposition in sulfur production from pyrite)

RN 471-34-1 HCA

CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

L90 ANSWER 34 OF 54 HCA COPYRIGHT 2004 ACS on STN

107:83651 Method for purifying stratal and drainage water of sulfur
pits. Gorshkov, V. P.; Salyuk, A. P. (USSR). U.S.S.R. SU 1296517 A1
19870315 From: Otkrytiya, Izobret. 1987, (10), 104. (Russian).
CODEN: URXXAF. APPLICATION: SU 1985-3852230 19850206.

AB Title method includes removal of suspended and colloidal
contaminants, air stripping of H₂S with subsequent chemical
treatment of the air-gas mixture and separation of the treated air,
electrochem.

treatment of the water, anion exchange filtration, and regeneration of the
anion exchanger. For a no-waste process, a decrease in reagent
consumption, and use of the treated water as heat carrier for underground
melting of S, after the suspended and colloidal contaminants are
removed hydroacoustically as concentrated product and electrochem. treatment of
clarified water in an electrolyzer, the anolyte is fed to the stripping
stage and anion exchanged and the catholyte is mixed with the air-gas
mixture after the chemical treatment stage and after removal of CaCO₃ and MgCO₃
in a sand filter, part of it is recombined with the treated anolyte and
use for heat exchange. The other part of the treated catholyte is used to
regenerate the anion exchanger and the spent regeneration solution is used to
wash the sand filter, then containing CaCO₄ and MgCO₄, used for chemical
treatment of the air-gas mixture, and mixed with the concentrated products
centrifuged. The sediment is discharged and the centrifugate is mixed
with incoming water. The sep. treated air, after catholyte mixing with
the air-gas mixture, is recycled to the stripping stage.

IC ICM C02F009-00

CC 61-5 (Water)

Section cross-reference(s): 49

ST waste free sulfur pit water treatment; hydrogen sulfide
air stripping water; electrochem treatment sulfur pit water;
anion exchange sulfur pit water

IT Water purification

(anion exchange, in multistage treatment of sulfur pit
stratal and drainage waters, with anion exchanger regeneration)

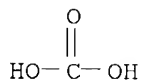
IT Water purification

(electrodialysis, anolyte and catholyte from, recycling of, in

treatment of **sulfur** pit stratal and drainage waters)
IT Water purification
(stripping, air, hydrogen **sulfide** removal in, of
sulfur pit stratal and drainage water)
IT 7704-34-9P, **Sulfur**, uses and miscellaneous
RL: PREP (Preparation); USES (Uses)
(drainage and stratal waters from pits for production of, multistage
treatment of, waste free)
IT 471-34-1, Calcium **carbonate**, uses and miscellaneous
546-93-0, Magnesium **carbonate**
RL: REM (Removal or disposal); PROC (Process)
(removal of, from catholyte mixture with hydrogen **sulfide**
-containing stripping air, in **sulfur** pit water treatment)
IT 7783-06-4, Hydrogen **sulfide**, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from **sulfur** pit stratal and drainage water, air
stripping for)
IT 7704-34-9P, **Sulfur**, uses and miscellaneous
RL: PREP (Preparation); USES (Uses)
(drainage and stratal waters from pits for production of, multistage
treatment of, waste free)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

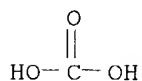
S

IT 471-34-1, Calcium **carbonate**, uses and miscellaneous
546-93-0, Magnesium **carbonate**
RL: REM (Removal or disposal); PROC (Process)
(removal of, from catholyte mixture with hydrogen **sulfide**
-containing stripping air, in **sulfur** pit water treatment)
RN 471-34-1 HCA
CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

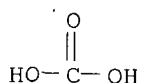
RN 546-93-0 HCA
CN Carbonic acid, magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Mg

L90 ANSWER 36 OF 54 HCA COPYRIGHT 2004 ACS on STN

- 106:122369 Method of **winning** of elemental **sulfur** from sulfur ore. Bylo, Zbigniew; Kolenda, Zygmunt; Jarosinska, Krystyna; Malinowska, Kazimiera; Krajewski, Jan; Krzeminski, Marian; Bold, Stanislaw; Kosinski, Zenobiusz (Akademia Gorniczo-Hutnicza, Pol.; Osrodek Badawczo-Rozwojowy Przemyslu Siarkowego "Siarkopol"). Pol. PL 127859 B1 19860210, 2 pp. (Polish). CODEN: POXXA7. APPLICATION: PL 1981-230270 19810319.
- AB After conventional flotation of a S ore (containing .apprx.18% S), the remelting S concentrate is leached to remove CaCO₃. Leaching is done by passing SO₂ for 1-3 h through a slurry containing 1-2.5 ton water/ton S concentrate at 293-313 K. The S concentrate is separated from the formed Ca(HSO₃)₂ solution which is used for cellulose manufacture Then, the S concentrate is subjected to conventional pressure-filtration refining. Thus, 200 kg S concentrate containing 76.45% S was mixed with 500 kg water, and the resulting slurry was blown 60 min with SO₂ at 293 K. The S concentrate was separated from the resulting Ca(HSO₃)₂ solution, washed, and dried at 378 K. The S content in the concentrate was 85.76%.
- IC C01B017-027
- CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 43
- ST **sulfur recovery** ore refining; calcium **carbonate** removal sulfur conc; sulfite calcium hydrogen sulfur
- IT Leaching
(of sulfur concentrate for calcium **carbonate** removal)
- IT 13780-03-5P
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in removal of calcium **carbonate** from sulfur concentrate by leaching with sulfur dioxide)
- IT 7446-09-5, Sulfur dioxide, uses and miscellaneous
RL: RCT (Reactant); RACT (Reactant or reagent)
(leaching by, of sulfur concentrate, for calcium **carbonate** removal)
- IT 7704-34-9P, Sulfur, preparation
RL: PREP (Preparation)
(**recovery** of, from ore, concentrate leaching for calcium **carbonate** removal in relation to)
- IT 471-34-1, Calcium **carbonate**, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from sulfur concentrate, by leaching with sulfur dioxide)
- IT 7704-34-9P, Sulfur, preparation
RL: PREP (Preparation)
(**recovery** of, from ore, concentrate leaching for calcium **carbonate** removal in relation to)
- RN 7704-34-9 HCA
- CN Sulfur (8CI, 9CI) (CA INDEX NAME)
- S
- IT 471-34-1, Calcium **carbonate**, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from sulfur concentrate, by leaching with sulfur dioxide)
- RN 471-34-1 HCA
- CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

L90 ANSWER 37 OF 54 HCA COPYRIGHT 2004 ACS on STN

105:26587 **Winning of pure sulfur** from

sulfur ore. Bylo, Zbigniew; Kolenda, Zygmunt; Jarosinska, Krystyna; Malinowska, Kazimiera; Krajewski, Jan; Krzeminski, Marian; Bold, Stanislaw; Kosinski, Zenobiusz (Akademia Gorniczo-Hutnicza, Pol.; Osrodek Badawczo-Rozwojowy Przemyslu Siarkowego "Siarkopol"). Pol. PL 127849 B1 **19831130**, 2 pp. (Polish). CODEN: POXXA7. APPLICATION: PL 1981-230047 19810306.

AB The yield of S was increased and the weight of **carbonate** residues was decreased when CO₂ was passed through S concentrate obtained from an ore containing 18% elemental S. Thus, 200 kg S concentrate (76.45% elemental S) and 200

kg water were stirred at 293 K while CO₂ was bubbled through for 60 min. Filtration, washing of filter cake, and drying gave enriched S concentrate containing 81.24% elemental S.

IC C01B017-027

CC **49-1** (Industrial Inorganic Chemicals)

Section cross-reference(s): 54

ST sulfur conc **carbonate** removal carbonationIT **7704-34-9P**, preparation

RL: PREP (Preparation)

(concentration of, from sulfur-containing ores, by carbon dioxide treatment)

IT **124-38-9**, uses and miscellaneous

RL: USES (Uses)

(sulfur-containing ores treated with, for sulfur enrichment)

IT **7704-34-9P**, preparation

RL: PREP (Preparation)

(concentration of, from sulfur-containing ores, by carbon dioxide treatment)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

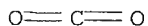
IT **124-38-9**, uses and miscellaneous

RL: USES (Uses)

(sulfur-containing ores treated with, for sulfur enrichment)

RN 124-38-9 HCA

CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)



L90 ANSWER 38 OF 54 HCA COPYRIGHT 2004 ACS on STN

102:81133 **Sulfur** and calcium **carbonate** from gypsum.

Batista de Queiroz, Agnaldo; Peres, Luciano dos Santos (Fundacao Instituto Tecnologico do Estado de Pernambuco, Brazil). Braz. Pedido PI BR 8300949

A 19841002, 12 pp. (Portuguese). CODEN: BPXXDX. APPLICATION:
BR 1983-949 19830113.

AB S and CaCO₃ are produced from gypsum in a multistage process. Crushed gypsum is calcined to the hemihydrate, reduced in a reducing zone (900-1000°) with charcoal and gases from the carbonization of firewood or cane bagasse, pelletized by rehydration of the hemihydrate to the dihydrate, which is reduced to CaS (with CO₂ and water recovery), and cooled, milled, and wetted to make a slurry. The **liquid** and solid phases are separated by centrifuges and pressurized filters, and the clear **liquid** containing soluble Ca(HS)₂ is fed under pressure to a 2nd reactor receiving CO₂ to cause formation of H₂S and impurity-free CaCO₃ precipitate. The H₂S produced in the 2nd reactor is fed under pressure to the 1st reactor, wherein S is produced by the Claus-Chance process.

IC C01F011-08

CC 49-9 (Industrial Inorganic Chemicals)

ST gypsum calcium **carbonate** sulfur prodn

IT 13397-24-5P, preparation

RL: PREP (Preparation)

(calcium **carbonate** and **sulfur** manufacture from)

IT 471-34-1P, preparation 7704-34-9P, preparation

RL: PREP (Preparation)

(preparation of, from gypsum)

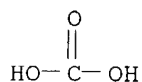
IT 471-34-1P, preparation 7704-34-9P, preparation

RL: PREP (Preparation)

(preparation of, from gypsum)

RN 471-34-1 HCA

CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 39 OF 54 HCA COPYRIGHT 2004 ACS on STN

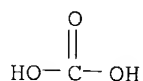
100:90660 Desulfurization by three-stage combustion. (Hitachi Shipbuilding and Engineering Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 58190606 A2

19831107 Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION:

JP 1982-71978 19820428.

AB Flue gas is desulfurized by a 3-stage combustion system having desulfurizing agent recovery unit, Claus S recovery unit, and a secondary desulfurizing apparatus. A fuel is fed to the 1st and 2nd combustors and then further combusted in a 3rd combustor with a secondary air supply. The flue gas is then treated in the secondary desulfurizing apparatus. A desulfurizing agent (CaCO₃, Na₂CO₃) and a portion of the effluent from the Claus unit are fed to the 2nd combustor. The spent desulfurizing agent is retrieved from the 2nd combustor to convert to **carbonate** which is recycled. The effluent from the **carbonate** converter is

treated in a Claus unit to recover S.
IC F23C011-00; B01D053-34; C01B017-04; F23C006-04
CC 59-4 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 49
IT Flue gases
(desulfurization of, 3-stage combustion system for, desulfurizing agent
and **sulfur recovery** in)
IT 497-19-8, uses and miscellaneous
RL: USES (Uses)
(for flue gas desulfurization, recycling of)
IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from flue gas desulfurization)
IT 497-19-8, uses and miscellaneous
RL: USES (Uses)
(for flue gas desulfurization, recycling of)
RN 497-19-8 HCA
CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



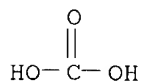
●2 Na

IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from flue gas desulfurization)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 40 OF 54 HCA COPYRIGHT 2004 ACS on STN
98:18862 Recovery of calcium **carbonate** and sulfur from FGD scrubber
waste. Arganbright, R. P.; Huang, P.; Benner, G. S.; Mandelik, B. G.;
Roche, T. S. (Pullman Kellogg, Houston, TX, USA). Report,
EPA-600/7-82-015; Order No. PB82-227729, 143 pp. Avail. NTIS From: Gov.
Rep. Announce. Index (U. S.) 1982, 82(20), 4091 (English) 1982.
AB The key process steps in the proprietary Kel-S process are demonstrated
for recovering CaCO₃ and S from lime/limestone flue gas desulfurization
(FGD) scrubber waste. The steps are: reduction of the waste to CaS (using
coal as the reducing agent), carbonation of the CaS to generate
H₂S and CaCO₃, and **recovery** of precipitated CaCO₃ from inerts
(coal ash).
CC 49-5 (Industrial Inorganic Chemicals)
Section cross-reference(s): 59
ST flue gas desulfurization; **sulfur recovery**; calcium
carbonate recovery
IT Flue gases
(desulfurization of, calcium **carbonate** and **sulfur**
recovery from)
IT 471-34-1P, preparation 7704-34-9P, preparation

RL: PREP (Preparation)
(recovery of, from limestone flue gas desulfurization scrubber waste)
IT 471-34-1P, preparation 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from limestone flue gas desulfurization scrubber waste)
RN 471-34-1 HCA
CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 41 OF 54 HCA COPYRIGHT 2004 ACS on STN
97:8588 Removing hydrogen sulfide from gas streams. Gowdy, Hugh W.; Fenton,
Donald M. (Union Oil Co., USA). U.S. US 4325936 A 19820420, 11
pp. Cont.-in-part of U.S. Ser. No. 50,193, abandoned. (English). CODEN:
USXXAM. APPLICATION: US 1981-233888 19810212. PRIORITY: US 1979-50193
19790620.

AB A H₂S removal and conversion method is described, in which a H₂S-containing
gas stream is contacted with a regenerable washing solution containing
solubilized V thiocyanate ions, a carboxylate complexing agent, and one or
more water-soluble quinones capable of solubilizing tetravalent V. The molar
ratio of V to quinone(s) in the washing solution is selected to substantially
reduce or eliminate the formation of contaminant sulfate salts. The
absorbed H₂S is converted to elemental S which, after oxidative
regeneration of the washing solution, is separated from the regenerated
solution

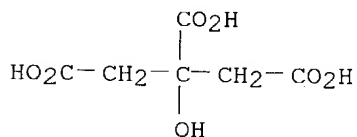
Thus, a gas containing H₂S 1, CO₂ 7, and N₂ 92 mol% was washed for 16.8 days
at 60°F and 1 atm with 0.037 L of washing solution/L of H₂S-containing
gas. The washing solution contained (in g/L): V 4.2, di-Na salt of
9,10-anthraquinone disulfonic acid (ADA, di-Na salt) 1.4, Na
1-hydroxybenzene-4-sulfonate (PSA) 22, NaSCN 87, Na citrate 13-16, Na
carbonate 24, Na₂S₂O₃ <0.2, and Na₂SO₄ 1.3-2.6. The rates of
change (g/L day) were: V 0.0, ADA di-Na salt 0.0, PSA Na salt 0.0, Na
citrate loss 0.16, Na **carbonate** 0.0, Na₂S₂O₃ 0.0, Na₂SO₄ gain
0.07. The mol. ratios were V/ADA 24 and V/PSA 0.74. The amount of H₂S
converted was: to S₂O₃²⁻ salts 0.0 and SO₄²⁻ salts 0.3%.

IC C01B017-05
NCL 423573000R
CC 49-10 (Industrial Inorganic Chemicals)
Section cross-reference(s): 48
ST hydrogen sulfide removal gas; quinone solubilizer vanadium; **sulfur**
recovery
IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from hydrogen **sulfide**-containing gases,

recyclable washing solution for)
 IT 994-36-5 1300-51-2 60553-45-9
 RL: USES (Uses)
 (solubilization by, of tetramine vanadium)
 IT 7704-34-9P, preparation
 RL: PREP (Preparation)
 (recovery of, from hydrogen sulfide-containing gases,
 recyclable washing solution for)
 RN 7704-34-9 HCA
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

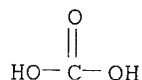
IT 994-36-5
 RL: USES (Uses)
 (solubilization by, of tetramine vanadium)
 RN 994-36-5 HCA
 CN 1,2,3-Propanetricarboxylic acid, 2-hydroxy-, sodium salt (9CI) (CA INDEX NAME)



●x Na

L90 ANSWER 42 OF 54 HCA COPYRIGHT 2004 ACS on STN
 95:171827 Conversion of alkali metal sulfate to the **carbonate**.
 Sheth, Atul C. (United States Dept. of Energy, USA). U. S. Pat. Appl. US
 80726 19800313, 18 pp. Avail. NTIS Order No. PAT-APPL-080 726.
 (English). CODEN: XAXXAV. APPLICATION: US 1979-80726 19791001.
 AB A process is described for converting K₂SO₄ to K₂CO₃ in which a mixture of
 K₂SO₄ and CaO are reacted at 700-800°, with a gaseous mixture having
 a minor amount of H₂ and/or CO in a diluent with the CaO being present in an
 amount <20 weight% of the K₂SO₄ to produce an aqueous mixture of K₂S, KHS,
 KOH, and
 CaS and a gaseous mixture of steam and H₂S. The K and Ca salts are quenched
 to produce an aqueous slurry of soluble K salts and insol. Ca salts and a
 gaseous
 mixture of steam and H₂S. The Ca salts are separated from the solution The Ca
 salts are dried to produce CaS, Ca bisulfide, and steam and the CaS and Ca
 bisulfide are converted to the oxide and recycled. The soluble K salts are
carbonated to produce K₂CO₃ which is concentrated and the precipitated crystals
 separated The S-containing compds. are treated further, e.g., by the Claus
 process.
 CC 48-8 (Unit Operations and Processes)
 Section cross-reference(s): 49
 ST potassium sulfate conversion **carbonate; sulfur**
recovery MHD power plant
 IT 7778-80-5, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)

(conversion of, to **carbonate**)
 IT **584-08-7P**
 RL: PREP (Preparation)
 (manufacture of, from potassium sulfate for MHD power plant)
 IT **7704-34-9P**, preparation
 RL: PREP (Preparation)
 (recovery of, from coal-fired MHD power plant)
 IT **584-08-7P**
 RL: PREP (Preparation)
 (manufacture of, from potassium sulfate for MHD power plant)
 RN 584-08-7 HCA
 CN Carbonic acid, dipotassium salt (8CI, 9CI) (CA INDEX NAME)



● 2 K

IT **7704-34-9P**, preparation
 RL: PREP (Preparation)
 (recovery of, from coal-fired MHD power plant)
 RN 7704-34-9 HCA
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 43 OF 54 HCA COPYRIGHT 2004 ACS on STN

95:120132 Aqueous **carbonate** process design study. McKisson, R. L.; Bauerle, G. L.; Bodine, J. E.; Rennick, R. D.; Stewart, A. E.; Tsang, S. (Energy Syst. Group, Rockwell Int. Corp., Canoga Park, CA, USA). Report, EPRI-CS-1574, 466 pp. Avail. NTIS From: Energy Res. Abstr. 1981, 6(4), Abstr. No. 4483 (English) **1980**.

AB The process involves a spray dryer in which the flue gas is scrubbed and its S removed as a dry Na₂SO₃/Na₂SO₄ plus Na₂CO₃ mixture. This is followed by a regeneration process which involves the reduction of the SO₃2-/SO₄2- to S²⁻ in a **molten** salt bed. This program involved studies of the **molten** salt reduction step and the conversion of an aqueous solution of the melt to a Na₂CO₃ scrubbing solution. A process flow diagram and a material balance were developed based on coal-reduction process data. The reduction process was more difficult to operate with coal than with coke. The greater ash content of the coal is a major factor in determining the operating temperature of the reducer, with the result that the coal-reduction required a

bed

temperature .apprx.55° higher than that for coke-reduction

CC 59-2 (Air Pollution and Industrial Hygiene)

Section cross-reference(s): **49**, **60**

IT Flue gases

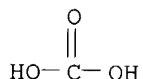
(desulfurization of, regeneration of waste from, reduction by coal in **molten** salt bed in)

IT Coal

RL: OCCU (Occurrence)

(flue gas desulfurization waste reduction by, in salt bed, for

- sulfur** recovery and regeneration of scrubber solution)
- IT Waste solids
(from flue gas desulfurization, reduction by coal in **molten** salt bath for **sulfur** recovery and regeneration of scrubber solution)
- IT Salts, uses and miscellaneous
RL: USES (Uses)
(**molten**, coal in, flue gas desulfurization waste treatment by, for **sulfur** recovery and regeneration of scrubber solution)
- IT 497-19-8, uses and miscellaneous
RL: USES (Uses)
(flue gas desulfurization scrubber solution containing, regeneration of)
- IT 7704-34-9P, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of, in reduction of sulfite-sulfate residue from desulfurization scrubbing solution, coal in **molten** salt bath in)
- IT 7757-82-6, reactions 7757-83-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction of, from spent desulfurization scrubber solution, coal in **molten** salt bed in)
- IT 497-19-8, uses and miscellaneous
RL: USES (Uses)
(flue gas desulfurization scrubber solution containing, regeneration of)
- RN 497-19-8 HCA
- CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

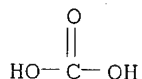
- IT 7704-34-9P, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of, in reduction of sulfite-sulfate residue from desulfurization scrubbing solution, coal in **molten** salt bath in)
- RN 7704-34-9 HCA
- CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 44 OF 54 HCA COPYRIGHT 2004 ACS on STN
94:5538 **Recovering** calcium and **sulfur** compounds from a metallurgical waste material. Collin, Per Harald (Swed.). PCT Int. Appl. WO 8000831 **19800501**, 12 pp. (English). CODEN: PIXXD2.
APPLICATION: WO 1979-SE200 19791004.

- AB Waste material containing CaO and CaS such as may be formed when S is removed from raw iron with lime or from preredn. of an iron ore with some grade of coal is treated. The CaO-CaS-containing waste is suspended in water for treatment with H₂S until the partial pressure of H₂S is 0.5-1.5 bar above the suspension and Ca(HS)₂ is in solution After the insol. material is removed, the solution is treated with CO₂ at a rate that assures that the

gaseous product contains H₂S with 10-30 volume% CO₂ and CaCO₃ is precipitated
IC C01F011-10; C01F011-18
CC 49-9 (Industrial Inorganic Chemicals)
ST iron ore preredn waste; hydrogen sulfide recovery;
calcium carbonate recovery
IT Wastes
(from iron ore preredn., calcium and sulfur compound
recovery from)
IT Iron ores, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(preredn. of, waste solids from, calcium and sulfur compound
recovery from)
IT 471-34-1P, preparation
RL: PREP (Preparation)
(preparation of, from iron ore preredn. waste solids)
IT 7704-34-9P, preparation 7783-06-4P, preparation
RL: PREP (Preparation)
(recovery of, from iron ore preredn. waste solids)
IT 471-34-1P, preparation
RL: PREP (Preparation)
(preparation of, from iron ore preredn. waste solids)
RN 471-34-1 HCA
CN Carbonic acid calcium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Ca

IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from iron ore preredn. waste solids)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 45 OF 54 HCA COPYRIGHT 2004 ACS on STN
93:243144 Rare anthropogenic and natural particles suspended in deep ocean
waters. Jedwab, Jacques (Lab. Geochim., Univ. Libre Bruxelles, Brussels,
B-1050, Belg.). Earth and Planetary Science Letters, 49(2), 551-64
(English) 1980. CODEN: EPSLA2. ISSN: 0012-821X.
AB Four hundred membrane filters from the Atlantic and Pacific deep waters
were scanned for colored and opaque particles by a method integrating the
light and the scanning electron microscopes, the electron microprobe and
the micro-x-ray diffraction camera. About 40 different types of particles
were found. A tentative classification of the particles and of their
morphol. and chemical varieties is presented, according to their
anthropogenic or natural origins. The particles fall into 5 groups: (1)
particle species exclusively produced by man's activities (brass, cobalt
aluminat); (2) particles exclusively produced by natural processes (like
amphibole, ilmenite); (3) particles rarely produced by natural processes,

but massively so by man (like metallic Cu, Cr₂O₃); (4) a large group of particles massively produced by nature and by man (like magnetite spherules, malachite); (5) a very small group of particles whose origin could not be attributed at present. Very few entirely new compds. from the point of view of continental mineralogy were encountered.

CC 53-5 (Mineralogical and Geological Chemistry)

IT **Carbonates**, occurrence

Silicates, occurrence

Sulfates, occurrence

Sulfides, occurrence

RL: OCCU (Occurrence)

(suspended particles of, in deep waters, of Atlantic and Pacific oceans)

IT **Carbonates**, occurrence

RL: OCCU (Occurrence)

(hydrogen, suspended particles of, in deep waters, of Atlantic and Pacific oceans)

IT **7704-34-9P**, occurrence

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of)

IT 1309-38-2, occurrence 1310-14-1 1317-60-8, occurrence 1317-80-2

1317-92-6 **1319-53-5** 7429-90-5, occurrence 7439-89-6, occurrence 7440-50-8, occurrence 12597-68-1, occurrence 12597-71-6, occurrence 15860-78-3

RL: OCCU (Occurrence)

(suspended particles of, in deep waters, of Atlantic and Pacific oceans)

IT **7704-34-9P**, occurrence

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

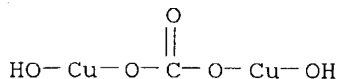
IT **1319-53-5**

RL: OCCU (Occurrence)

(suspended particles of, in deep waters, of Atlantic and Pacific oceans)

RN 1319-53-5 HCA

CN Malachite (Cu₂(CO₃)(OH)₂) (9CI) (CA INDEX NAME)



L90 ANSWER 46 OF 54 HCA COPYRIGHT 2004 ACS on STN

89:45792 Treatment of an alkali metal sulfide solution. Rennick, Robert D.

(Rockwell International Corp., USA). Ger. Offen. DE 2741613

19780316, 24 pp. (German). CODEN: GWXXBX. APPLICATION: DE

1977-2741613 19770915.

AB The solution is treated to recovery S. An alkaline solution with >60 mol % of an

alkali metal sulfide is contacted in a neutralization zone with a H₂S-containing gas to form a solution of reduced alkalinity containing a large amount of an

alkali metal bisulfide and a lesser amount of the **carbonate** or bicarbonates. The solution is then contacted with a gas containing a low concentration

of CO₂ to yield **carbonate** crystals free of sulfides and sulfites and a product gas high in H₂S, 35-65% of which is used in the neutralization zone and the rest treated in a Claus facility to produce S. The **carbonate** product stream is decomposed thermally to yield a waste gas high in CO₂ and an aqueous slurry containing mainly **carbonates**. The CO₂ is used in the carbonating step.

IC C01B017-06

CC 49-1 (Industrial Inorganic Chemicals)

ST sulfide alkali metal decompn; **sulfur recovery**

IT 124-38-9, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with alkali metal **sulfide**, in **sulfur recovery**)

IT 7704-34-9P, preparation

RL: PREP (Preparation)
(recovery of, from alkali metal sulfide solns., carbon dioxide in)

IT 7783-06-4D, alkali metal salts

RL: USES (Uses)
(**sulfur recovery** from, carbon dioxide in)

IT 124-38-9, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with alkali metal **sulfide**, in **sulfur recovery**)

RN 124-38-9 HCA

CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

IT 7704-34-9P, preparation

RL: PREP (Preparation)
(recovery of, from alkali metal sulfide solns., carbon dioxide in)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 47 OF 54 HCA COPYRIGHT 2004 ACS on STN

87:41450 Removal of hydrogen sulfide from natural gas to obtain elemental sulfur. Kalymon, Ya. A.; Mel'nik, V. F.; Konovalenko, Z. L.; Pogonets, O. A.; Tomin, I. I. (USSR). Tezisy Dokl. Vses. Nauchno-Tekh. Konf. Tekhnol. Neorg. Veshchestv Miner. Udobr., 9th, Volume 1, 210-11. Editor(s): Amirova, S. A. Permsk. Politekh. Inst.: Perm, USSR. (Russian) 1974. CODEN: 34PSAU.

AB Optimum condition were discussed for removal of H₂S from natural gas by chemisorption in a Na₂CO₃ solution and preparation of elemental S by **oxidn** of H₂S with organic catalysts dissolved in the Na₂CO₃ solution

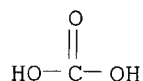
CC 51-4 (Fossil Fuels, Derivatives, and Related Products)

Section cross-reference(s): 49, 67

ST natural gas hydrogen sulfide removal; **sulfur** prepn hydrogen **sulfide oxidn**; catalyst hydrogen **sulfide oxidn**

IT Chemisorption

- (of hydrogen sulfide in sodium **carbonate**, for sweetening of natural gas)
- IT Oxidation catalysts
(soluble organic, for **recovery** of **sulfur** from sweetening of natural gas)
- IT **497-19-8**, uses and miscellaneous
RL: USES (Uses)
(in removal of hydrogen sulfide from natural gas and associated **sulfur recovery**)
- IT **7704-34-9P**, preparation
RL: PREP (Preparation)
(preparation of, removal of hydrogen sulfide from natural gas in relation to)
- IT **497-19-8**, uses and miscellaneous
RL: USES (Uses)
(in removal of hydrogen sulfide from natural gas and associated **sulfur recovery**)
- RN **497-19-8** HCA
- CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

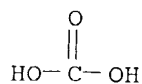
- IT **7704-34-9P**, preparation
RL: PREP (Preparation)
(preparation of, removal of hydrogen sulfide from natural gas in relation to)
- RN **7704-34-9** HCA
- CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 48 OF 54 HCA COPYRIGHT 2004 ACS on STN
86:142270 Study of reagent conditions for autoclave melting of sulfur. Tsap, S. M.; Mel'nik, V. F. (USSR). Tezisy Dokl. Vses. Nauchno-Tekh. Konf. Tekhnol. Neorg. Veshchestv Miner. Udobr., 9th, Volume 1, 203-4. Editor(s): Amirova, S. A. Permsk. Politekh. Inst.: Perm, USSR. (Russian) **1974**. CODEN: 34PSAU.

- AB To optimize the melting of S, the relation between reagent conditions and composition and the properties of the concs. was investigated. The optimum consumption of Na₂CO₃ corresponds to the amount necessary for binding Ca²⁺ and Mg²⁺ contained in the water added during melting. Na5P3010 consumption depends on the overall surface area of the barren rock. The efficiency of extracting S is decreased by sludge formation.
- CC **49-1** (Industrial Inorganic Chemicals)
- ST sulfur melting autoclave; sodium **carbonate** sulfur melting; triphosphate sulfur ore extn
- IT **497-19-8**, uses and miscellaneous **7758-29-4**
RL: USES (Uses)
(in **sulfur recovery** from ore concs., by melting)

IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from ore concs. by melting, optimization of)
IT 497-19-8, uses and miscellaneous
RL: USES (Uses)
(in **sulfur recovery** from ore concs., by melting)
RN 497-19-8 HCA
CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from ore concs. by melting, optimization of)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

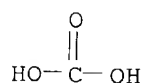
L90 ANSWER 49 OF 54 HCA COPYRIGHT 2004 ACS on STN
83:47666 **Recovery** of **sulfur** dioxide. Shah, Indravadan S.
(Chemical Construction Corp., USA). Can. CA 949289 **19740618**, 13
pp. (English). CODEN: CAXXA4. APPLICATION: CA 1971-114866 19710604.
AB Waste gases containing SO₂ are scrubbed with a Na sulfite solution to form a Na
bisulfite solution, part of which is reacted with Ca and/or MgCO₃ to form a
precipitate which is heated, forming a recoverable S-containing product and
solid
particles of Mg and/or CaO. The remaining part of the bisulfite solution is
regenerated with Na₂CO₃ and recycled for further waste gas scrubbing.
Thus, flue gas containing SO₂ 2000 ppm was delivered at 3010 m³/min and
scrubbed to remove .apprx.94% of the initial SO₂ content. After complete
processing S was recovered at a rate of 5.45 kg/min.
CC 59-2 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): **49**
ST **sulfur recovery** waste gas
IT Flue gases
(sulfur dioxide removal from, by sodium bisulfite scrubber solution and
magnesium **carbonate**, **sulfur recovery** in)
IT **546-93-0**
RL: OCCU (Occurrence)
(desulfurization scrubber solution treatment by, **sulfur**
recovery in)
IT **7704-34-9P**, preparation
RL: PREP (Preparation)
(**recovery** of, in **sulfur** dioxide removal from flue
gas by sodium bisulfite scrubber solution and magnesium **carbonate**
)
IT 7446-09-5, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)

(removal of, from flue gas by sodium bisulfite scrubber solution and magnesium **carbonate, sulfur recovery** in)

IT 7631-90-5
RL: OCCU (Occurrence)
(sulfur dioxide removal by scrubber solution containing, from flue gas, **sulfur recovery** in)

IT 546-93-0
RL: OCCU (Occurrence)
(desulfurization scrubber solution treatment by, **sulfur recovery** in)

RN 546-93-0 HCA
CN Carbonic acid, magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



● Mg

IT 7704-34-9P, preparation
RL: PREP (Preparation)
(**recovery** of, in **sulfur** dioxide removal from flue gas by sodium bisulfite scrubber solution and magnesium **carbonate**)

RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 50 OF 54 HCA COPYRIGHT 2004 ACS on STN
80:99731 Chemistry of the **molten carbonate** process for **sulfur** oxides removal stack gases. Yosim, S. J.; Grantham, L. F.; McKenzie, D. E.; Stegmann, G. C. (At. Int. Div., Rockwell Int. Corp., Canoga Park, CA, USA). Advances in Chemistry Series, 127, 174-82 (English) 1973. CODEN: ADCSAJ. ISSN: 0065-2393.

AB In the molten **carbonate** process, a molten eutectic mixture of Li, Na, and K **carbonates** removes S oxides from power plant stack gases. The resulting molten solution of alkali metal sulfites, sulfates, and unreacted **carbonate** is regenerated in a 2-step process to the alkali **carbonate** for recycling. H₂S, which is evolved in the regeneration step, is converted to S in a conventional Claus plant. A 10-MW pilot plant of the process has been constructed at the Consolidated Edison Arthur Kill Station on Staten Island, and startup is underway.

CC 59-2 (Air Pollution and Industrial Hygiene)
ST **carbonate** sulfur oxide removal; stack gas sulfur oxide removal
IT **Carbonates**, uses and miscellaneous
RL: USES (Uses)
(**sulfur** oxide removal by **molten**, from flue gas)

IT Flue gases
(**sulfur** oxide removal from, **molten carbonates** in)

IT 7704-34-9P, preparation
RL: PREP (Preparation)

(recovery of, in sulfur oxide removal from flue gas by molten
carbonates)

IT 7446-09-5, uses and miscellaneous 7446-11-9, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)

(removal of, from flue gas, molten **carbonates** in)

IT 497-19-8, uses and miscellaneous 554-13-2
584-08-7

RL: USES (Uses)

(**sulfur** oxide removal by **molten**, from flue gas)

IT 7704-34-9P, preparation

RL: PREP (Preparation)

(recovery of, in sulfur oxide removal from flue gas by molten
carbonates)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

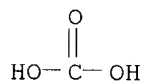
IT 497-19-8, uses and miscellaneous 554-13-2
584-08-7

RL: USES (Uses)

(**sulfur** oxide removal by **molten**, from flue gas)

RN 497-19-8 HCA

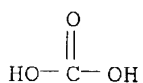
CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

RN 554-13-2 HCA

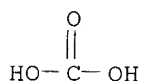
CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



●2 Li

RN 584-08-7 HCA

CN Carbonic acid, dipotassium salt (8CI, 9CI) (CA INDEX NAME)



●2 K

L90 ANSWER 51 OF 54 HCA COPYRIGHT 2004 ACS on STN

80:52188 Treating **liquid** waste containing **sulfur**.

Ninagawa, Hiroshi Jpn. Kokai Tokkyo Koho JP 48063967 **19730905**

Showa, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1971-99728
19711209.

AB The spent alkaline waste solution used to remove H₂S was recovered. CO₂ was bubbled into the solution at a temperature above the decomposition temperature of alkali H

carbonate to react with alkali H sulfide or alkali sulfide. The H₂S evolved with CO₂ was removed from the solution and was absorbed in a solution for recovery of elementary S.

NCL 13(7)A21

CC 60-2 (Sewage and Wastes)

IT **124-38-9**, uses and miscellaneous

RL: USES (Uses)

(hydrogen sulfide removal by, from desulfurizer scrubber solution, sulfur recovery in)

IT **7704-34-9P**, preparation

RL: PREP (Preparation)

(recovery of, from desulfurizer scrubber solution, carbon dioxide in)

IT **124-38-9**, uses and miscellaneous

RL: USES (Uses)

(hydrogen sulfide removal by, from desulfurizer scrubber solution, sulfur recovery in)

RN 124-38-9 HCA

CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

IT **7704-34-9P**, preparation

RL: PREP (Preparation)

(recovery of, from desulfurizer scrubber solution, carbon dioxide in)

RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 52 OF 54 HCA COPYRIGHT 2004 ACS on STN

79:106507 **Sulfur** from Claus-process off-gases. Peter, Siegfried

Ger. Offen. DE 2165646 **19730705**, 14 pp. (German). CODEN:

GWXXBX. APPLICATION: DE 1971-2165646 19711230.

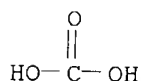
AB **H₂S** and SO₂ from the off-gases of the S separator of the 2nd catalyst step of the Claus-process were converted to S by washing at 120° with polyalkylene glycols or their ethers, e.g. triethylene glycol (I) or hexaethylene glycol monobutyl ether in the presence of alkanolamines, e.g. (HOCH₂CH₂)₃N or [MeCH(OH)CH₂]₂NH (II), triethylenetetramine, or KHCO₃ as catalyst. Thus, a gas containing N 70, H₂O(g) 25, **H₂S** 3.5, and SO₂ 1.5 volume % was passed through a solution containing 8% II in I to give a gas containing 0.5 volume % **H₂S** and traces SO₂. The **liquid** S formed was drawn off the bottom and was of clear yellow color after solidification.

IC C01B

CC **49-1** (Industrial Inorganic Chemicals)

Section cross-reference(s): 59

- ST **sulfur** Claus process gas; hydrogen **sulfide**
sulfur; oxide **sulfur** hydrogen **sulfide**;
polyalkylene glycol gas washing; ether polyalkylene glycol washing;
alkanolamine catalyst **sulfur**; ethyleneamine catalyst
sulfur; amine catalyst **sulfur**; potassium
carbonate catalyst **sulfur**
- IT Catalysts and Catalysis
(amines and potassium **carbonate**, for hydrogen **sulfide**
-**sulfur** dioxide reaction)
- IT 102-71-6, uses and miscellaneous 110-97-4 112-24-3 141-43-5, uses
and miscellaneous **298-14-6** 622-40-2
RL: CAT (Catalyst use); USES (Uses)
(catalysts, in **sulfur** manufacture from Claus process gases)
- IT **7704-34-9P**, preparation
RL: PREP (Preparation)
(from hydrogen **sulfide**- and **sulfur** dioxide-containing
gases, by washing with polyalkylene glycols containing alkaline catalysts)
- IT 112-27-6 112-60-7 1072-40-8 1191-91-9 4403-55-8 4792-15-8
25322-68-3 25322-69-4
RL: USES (Uses)
(in **sulfur** manufacture from Claus-process gases, washing with)
- IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(with hydrogen **sulfide**, for **sulfur** manufacture from
Claus process gases)
- IT 7783-06-4, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(with **sulfur** dioxide, for **sulfur** manufacture from Claus
process gases)
- IT **298-14-6**
RL: CAT (Catalyst use); USES (Uses)
(catalysts, in **sulfur** manufacture from Claus process gases)
- RN 298-14-6 HCA
- CN Carbonic acid, monopotassium salt (8CI, 9CI) (CA INDEX NAME)



● K

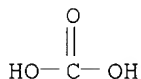
- IT **7704-34-9P**, preparation
RL: PREP (Preparation)
(from hydrogen **sulfide**- and **sulfur** dioxide-containing
gases, by washing with polyalkylene glycols containing alkaline catalysts)
- RN 7704-34-9 HCA
- CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 53 OF 54 HCA COPYRIGHT 2004 ACS on STN
74:143938 Converting soda slag from a blast furnace to useful products.

(Kloeckner-Humboldt-Deutz A.-G.). Ger. Offen. DE 1934308 **19710211**, 14 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1969-1934308 19690707.

- AB A continuous flow process is described whereby obnoxious and poisonous H₂O-soluble and easily decomposable constituents of a slag can be removed and converted to other products. Specifically, slag is ground with H₂O. The solution which contains primarily Na₂S is separated from the insol. portion and is treated with CO₂ at elevated temps. at a high pressure. H₂S is liberated from the solution and NaHCO₃ is formed in solution. The H₂S is oxidized to elemental S and NaHCO₃ isolated from the solution and converted to Na₂CO₃ by calcination.
- IC C01D; C01B; C21C
- CC **49** (Industrial Inorganic Chemicals)
- ST blast furnace sulfide slag conversion; **sulfur recovery**; sodium **carbonate** recycling
- IT Slags
(sodium sulfide removal from blast-furnace, for sodium **carbonate** and **sulfur recovery**)
- IT **497-19-8P**, preparation **7704-34-9P**, preparation
RL: PREP (Preparation)
(**recovery** of, from sodium **sulfide** from blast-furnace slags)
- IT 1313-82-2
RL: REM (Removal or disposal); PROC (Process)
(removal of, from blast-furnace slags for recovery of sodium **carbonate** and sulfur)
- IT **497-19-8P**, preparation **7704-34-9P**, preparation
RL: PREP (Preparation)
(**recovery** of, from sodium **sulfide** from blast-furnace slags)
- RN 497-19-8 HCA
- CN Carbonic acid disodium salt (8CI, 9CI) (CA INDEX NAME)



●2 Na

- RN 7704-34-9 HCA
- CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L90 ANSWER 54 OF 54 HCA COPYRIGHT 2004 ACS on STN
74:55749 Carbon oxide regenerant for **sulfur** recovery from **molten** salts. Grantham, Le Roy F. (North American Rockwell Corp.). U.S. US 3551108 **19701229**, 8 pp. Division of U.S. 3,438,734 (English). CODEN: USXXAM. APPLICATION: US 1968-779175 19681126.

- AB A method is described for direct recovery of elemental S from the **molten** salt mixture used for desulfurizing flue gases according to the process of U.S. 3,438,734. The **molten** salt mixture containing

alkali metal sulfites is treated at 400-50° with H and (or) CO to reduce partially the sulfites to **sulfides**. The melt is then treated with CO₂ whereby elemental S vapor and a melt of alkali metal **carbonates** are formed. The **molten carbonates** are recycled to the flue gas desulfurization step and the S is condensed from the vapor as product. The method avoids formation of H₂S as an intermediate requiring conversion to S.

IC C01D; C01B
NCL 023224000
CC 49 (Industrial Inorganic Chemicals)
ST **sulfur** recovery; flue gases desulfurizing; gases flue desulfurizing; desulfurizing flue gases
IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from alkali metal sulfites by reduction with carbon oxides and hydrogen)
IT 124-38-9, reactions 630-08-0, reactions 1333-74-0, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction by, of alkali metal sulfites for **sulfur** recovery)
IT 7704-34-9P, preparation
RL: PREP (Preparation)
(recovery of, from alkali metal sulfites by reduction with carbon oxides and hydrogen)
RN 7704-34-9 HCA
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 124-38-9, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction by, of alkali metal sulfites for **sulfur** recovery)
RN 124-38-9 HCA
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

=>